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AN ATTEMPT TO INTERPRET PRESENT-DAY USES OF VACCINES*

THEOBALD SMITH, M.D.

George Fabyan Professor of Comparative Pathology, Harvard Medical School

BOSTON

The artificial production of immunity toward infectious diseases by the use of modified viruses has been one of the major problems of medical science for a generation. The antecedents which have led up to such an intensive cultivation of this subject are relatively few and simple. Persons who successfully passed through an attack of such a characteristic disease as small-pox were thereafter able to mingle with the diseased, nurse them, and remain well. Persons who had been inoculated with the products of this affection developed a relatively mild type of small-pox, and were thereby protected from the more severe spontaneous attack. Owners of domestic animals had also, at times, resorted to such inoculations to hurry along an animal plague, by inducing a somewhat less severe attack. These facts are said to have been known to the Chinese thousands of years ago. In the last years of the eighteenth century Jenner made known his discovery that cowpox inoculated into man protected him against small-pox.

The scientific imagination of Pasteur, carrying these simple data into the domain of experimental biology, evolved new methods for inducing immunity, not only before but also after natural infection had taken place, by subjecting the respective viruses to various modifying processes. Since Pasteur's time the attempts at modifying viruses to make them as harmless as possible, while retaining their efficacy as immunizing agencies, has been steadily going on. Moreover, their use is no longer limited to the prevention of infection, but it has been boldly carried to the heart of disease itself. There is scarcely an infection, however active in its manifestation, which is not at present attacked with vaccines. Properly to evaluate this present-day movement in medicine in the time at my disposal, even in its gross outlines, is impossible. I can only indicate a few fundamental, well-established facts in experimental medicine and suggest a few hypotheses which we may use as lanterns to penetrate here and there the dense gloom which still hovers over immunity in some of its manifestations.

Perhaps the most important aid we can get is from a study of the natural history of infectious diseases; in other words, from an inquiry into what Nature herself accomplishes with one attack of a given disease. In this study we shall find it convenient to group together infections among the members of which a certain degree of similarity exists, and within which the production of immunity requires approximately the same expenditure of energy. Thus, the eruptive diseases are in a class by themselves. They run their course with relative rapidity and the system rids itself of the infecting agent completely. They appear to be of all diseases the most readily amenable to vaccination. There is a great gap between these affections and such diseases as leprosy on the one hand, and malaria on the other. In the former the disease may last a lifetime, and it would be difficult to determine just what degree of immunity is gained by the leper. Malaria may eventually subside, but the infecting agent may persist indefinitely. Until recently it was quite generally denied that any immunity could be acquired toward the malarial parasite. The same doubts have been maintained toward the acquisition of immunity in tuberculosis.

Recently, P. H. Römer[1] has shown that guinea-pigs made tuberculous by minute doses of virus become immune to subsequent infection with minute doses, applied to the skin, which cause a progressive disease in control animals. The tuberculous guinea-pig, according to his further researches, becomes immune to the feeding and the inhalation of tubercle bacilli, and to contact infection in cages with guinea-pigs having tuberculous ulcers. The study of protozoan parasites causing the various forms of piroplasmosis and malaria has shown that immunity which is pronouncedly geographic is due not to any climatic or telluric factors influencing the general resistance, but simply to the fact that the human beings and animals had been under the influence of the virus for unknown periods. Tropical races may or may not be immune to malaria, according as they have or have not lived where the disease is endemic.

These illustrations must suffice to show not only that the body responds somewhat differently toward each group of infectious diseases and, in fact, toward each disease, but also that its second response to the same parasite is different from the first, and that in this response it manifests an increased opposition to the parasite. The researches of the past twenty-five years have shown definitely that all parasites, from the ultramicroscopic forms to the higher entozoa, induce in the body of the host a degree of antagonism higher than that existing before invasion. This antagonism may not be sufficient to eliminate the parasites; it may not even be strong enough to check the march of the invasion and the progressive disease resulting therefrom; it may even in some of its stages, be injurious to the host as when it leads to hypersensitiveness or anaphylaxis. This increased antagonism exists, however insignificant it may seem to us. The view formerly prevailing that in some

* Address at the Annual Conversational Meeting of the Philadelphia Pathological Society, 1913.

1. Römer, P. H.: Beitr. z. Klin. d. Tuberk., 1912, xxii, 265.

infections one invasion predisposes to others, must be abandoned. Clinically, acquired predisposition may be simulated when an organ is injured and its physiologic working impaired by the former attack, so that these injuries overbalance the normal resistance plus any acquired specific immunity. This changed attitude of the body following invasion has been denominated allergy by von Pirquet. The nature of the allergic attitude probably depends on a combination of factors which are not precisely the same for any two diseases.

The reserve forces which the body mobilizes and uses in establishing this higher level of resistance during an attack of an infectious disease, have been made the subject in recent years of most intensive laboratory study and analysis. As a result, a new field of work, immunology, has been mapped out as worthy of independent cultivation. It has resolved acquired immunity into a number of component substances and activities. They are familiar to us under the names of antitoxins, agglutinins, precipitins, opsonins, tropins, complement-fixing bodies and phagocytosis.

This analysis, though of the greatest value to diagnosis, has not yet been followed by a synthesis which is to explain to us the relative importance of these various antibodies, and to range them in proper order into a complete whole. No simple infectious disease has been completely analyzed and its underlying machinery laid bare. Whether such an analysis is even attainable, considering the minuteness of the parasitic invaders and the host cells and the complex processes going on between them, must remain questionable. To estimate the degree of immunity attained through disease, we cannot rely solely on any quantitative determination of any one or more immune bodies which have appeared, since we do not know their relative importance. We must judge the efficiency of the immunity by determining to what degree the individual as a whole is being protected.

METHODS OF CONFERRING IMMUNITY

Taking it for granted, then, that it is possible to raise the level of resistance toward an infectious disease artificially, no matter what kind of micro-organism is the specific agent, let us glance for a moment at the methods which have been used for this purpose. Beginning with the fundamental work of Pasteur we find him committed to the method of using the actual living virus of a disease as a vaccine, but modified as much as possible so as to produce the least harm compatible with an effective immunity. Pasteur used physical agents as well as passages through series of animals of an experimentally selected species. This method of using a living virus has maintained itself in the practice of immunizing domestic animals against various plagues; but in the immunization of the human subject, viruses exposed to the lowest temperatures that will destroy life have been used almost or quite exclusively. In experiment and practice, the living viruses have proved themselves superior to heated ones in calling forth immunity. But there is an element of danger associated with them which may assert itself at any moment. The living vaccine may prove too virulent and cause actual disease. The vaccinated may become carriers and dangerous, if not to their own kind, to other species. The micro-organisms of these carriers may regain their former virulence.

Illustrations of these possibilities may be drawn from animal vaccinations, and probably every one who has dealt with them can cite cases. In a series of about one hundred calves inoculated with the weakest human tubercle culture on hand, one contracted tuberculosis of the eyes. This accident is of no moment among calves, but it might cause great commotion if occurring in a human subject. Cattle vaccinated with human tubercle bacilli may excrete the bacilli for months in the milk. Griffiths[2] has reported the case of a cow vaccinated as a young calf, shedding such bacilli in the milk. The recrudescence of virulence depends on the nature of the virus and the degree of change induced artificially. Among tubercle bacilli, changes go on very slowly. A bovine type with which a calf had been infected showed on glycerin agar, when recovered from the calf about eighteen months later, the same case of growth which it possessed before inoculation. There was no indication of a return to the parasitic habit, in which condition it fails to multiply on the medium referred to. Few species of bacteria, however, possess the inertia of this bacillus. In a body already infected with some other virus, living vaccines may cooperate with this virus and become pathogenic for that individual.

Among the reasons urged why living attenuated viruses should be so much superior to dead viruses, none has yet proved adequate to explain satisfactorily the difference in effectiveness. With some bacteria, heat-labile substances may have important antigenic properties. There may be important immunizing substances produced only by bacteria in the presence of the antiforeign activities of the host tissues. Some years ago I called attention to the continuity of action exerted by living micro-organisms as contrasted with the discontinuous action of dead cultures. Living cultures, even when multiplying but feebly, produce an infinite number of minute blows as compared with the single blow of dead cultures followed by speedy elimination. Living microbes may penetrate into different territories where antibodies are most easily produced; dead microbes often remain where deposited. Barring accidents, the use of living virus is the most certain and most economical way of calling forth a maximum output of antibodies.

The use of so-called sensitized viruses is one which should receive more attention. I may recall here the influence of diphtheria toxin mixed with antitoxin on the production of active immunity.[3] A mixture of toxin and antitoxin which still produces a large local lesion in the guinea-pig induces a high degree of active immunity. Following the gradual addition of more antitoxin, the active immunity sinks, but it is still quite marked when neutral mixtures are used. If we continue to add immune serum the active immunity goes on sinking and reaches zero when a considerable surplus of antitoxin has been added to the toxin. Why does a single injection of a neutral mixture surpass in effectiveness many doses of pure toxin? I have answered this question as follows: The toxin mixed with the antitoxin penetrates quite generally through the body, whereas the pure toxin is chiefly held at or near the place of injection. This diffusion tends to cause maximum antibody formation, over a wide territory, by a relatively very small amount of free or perhaps dissociable toxin in the toxin-antitoxin mixture. The proof that the toxin is diffused under the influence of the antitoxin is suggested by the fact that paralysis is almost never induced by the injection of pure toxin subcutaneously, but it frequently occurs when the toxin is injected into the circulation. The toxin-antitoxin mixture frequently produces paralysis, even though injected subcutaneously. The bearing of these observations on living or dead bacilli sensitized with immune serum should be studied, for I am inclined

2. Griffiths: Jour. Path. and Bacteriol., xvii, 322.
3. Smith, Theobald: Jour. Exper. Med., 1909, xi, 241.

to think that a similar phenomenon of diffusion may occur. Some years ago Sobernheim[4] applied this method for anthrax vaccination in domestic animals by mixing anthrax cultures of a certain degree of attenuation with an anthrax-immune serum. More recently Metchnikoff[5] and Besredka have applied it in immunization against typhoid fever. This method, it should be stated, has failed with such filterable viruses as those of foot-and-mouth disease, rinderpest and hog cholera. The mixture either produces an unmitigated attack or else neither disease nor immunity.

The advantages of living over heated vaccines must, however, diminish with the attenuation of the living virus. There must be some point in this attenuation when multiplication in the tissues of the host is no longer possible. In such a case the virus can be of no more use than killed virus, unless some very labile substance in the virus, already referred to, which is easily destroyed by heat, acts as an important antigen. The question of the superiority of heated over living virus, or the reverse, resolves itself into finding that stage of attenuation in the latter which is still superior to the former as a vaccine, and is yet relatively harmless. The future exigencies of the race may be such that the possible dangers inherent in living vaccines will have to be ignored by those who seek a stable protection.

The search for effective vaccines has not halted with heated bacteria, but has gone on toward certain products of mechanical and chemical disintegration. These attempts have all been more or less empirically conceived. Beginning with Koch's old tuberculin, which is a spontaneous secretion or disintegration product of the tubercle bacillus, we have had a variety of other products of this bacillus including the lipoid substances and the miscellaneous substances contained in filtrates from fluid cultures used as vaccines. Bacteria have been subjected to various mechanical processes such as grinding and prolonged shaking, resulting in Koch's tuberculin T. R., MacFadyean's typhoid endotoxin, and von Wassermann's shake extracts. When we attempt to discover any underlying guiding principles prompting these special methods of disintegration, we find few propounded. Koch ground his tubercle bacilli and extracted them in order to get them into solution for prompt absorption, and this idea may have governed others.

RELATION OF IMMUNIZING AND TOXIC ELEMENTS OF VACCINES

From time to time there have been advocates of the hypothesis that the immunizing and the toxic principles of micro-organisms are distinct, and that if they could be successfully isolated, the use of the immunizing substance alone as a vaccine might not only evade the injury accompanying the use of entire organisms, but even improve on living vaccines. Such a view, though perhaps not expressed, may be read between the lines of the publications dealing with actual experimental work in this direction. It may not be out of place here to present some theoretical considerations bearing on the question of the identity or non-identity of toxic and immunizing substances of micro-organisms.

All parasites in their attempt to make use of the living body as a source of food and a nidus for multiplication must be prepared to meet the general antiforeign forces of the host's tissues. The body is so constituted as to assimilate or attempt to assimilate all foreign substances. The usual enteral route makes ample provision for this in the normal processes of digestion. The parenteral route, however, is not so well adapted to make over foreign substances entering its tissues. Abderhalden and others[6] have shown that even in this respect the body is remarkably well adapted to assimilate proteins, carbohydrates and fats by rapidly producing or mobilizing ferments after the first injection which take care of these substances. Abderhalden distinguishes substances as cell-foreign, blood-foreign and body-foreign. Substances out of place may do harm unless promptly assimilated to their environment. All invading parasites must meet these antiforeign agencies by protecting themselves with various devices, among which I should range a special modification or adaptation of the cell membrane of the parasite, including the formation of capsules. There may also be secretions of the bacteria which successfully paralyze the antiforeign forces (aggressins of Bail). These various protective devices may be called defensive in contradistinction to those which, like the soluble toxins, are offensive in so far as they directly attack and injure living tissues. The normal antiforeign forces of the body, though manifestly defensive against invasion, are also offensive in that they tend to disintegrate and assimilate as already stated. The antibodies formed during the course of an infectious disease are more properly styled defensive, since they appear only under severe provocation.

It will be noted that, as in war, I distinguish between offensive and defensive operations, the defensive of one side fitting into or being adapted to the offensive of the other. There may exist only offensive or only defensive functions, or a mixture of the two, according to the parasite. Thus the diphtheria bacillus is chiefly offensive. By injuring the mucosa with its toxin, it obtains at once a rich food-supply and a shelter in the inflamed and necrotic membrane, where it multiplies at a rapid rate. The tubercle bacillus, on the other hand, may act with the aid of a preponderance of defensive mechanisms. To explain why only a small number of species of bacteria have become parasites, we must assume that they were endowed at the start, while free-living, with structural or functional peculiarities enabling them at once to take the offensive or the defensive. The anthrax bacillus, for instance, is a free-living species, very much like a number of similarly free-living but harmless species. Through some peculiar endowment it can multiply in the blood of many hosts. Some refer this power to the capacity of producing protective capsules in the body.

After the parasites have fastened themselves on their host, adaptive processes continue to mold and augment the necessary defensive functions, and the special capacity for such adaptation and its final result determine the character of the parasitism and the accompanying specific infectious disease. During this period of adaptation many parasites probably lose their original offensive weapons in whole or in part, and exaggerate their defensive ones, for very few of the truly invasive bacteria produce early soluble toxins like those of the diphtheria bacillus, which has remained a surface parasite. The so-called endotoxins of R. Pfeiffer, which belong to the bodies of the bacteria, play only a secondary, belated part in the established parasitism. They cannot be regarded as enabling a bacterium to establish itself in the tissues of the host, and they become active only with the dissolution of the bacterium.

4. Sobernheim: Berl. klin. Wchnschr., 1902, p. 516.
5. Metchnikoff: Ann. de l'Inst., Pasteur, xxv, 193.
6. Abderhalden: Die Schutzfermente des tierischen Organismus, 1912.

In what we call natural immunity, normal antiforeign functions are sufficient to destroy and assimilate the bacteria, for naturally immune animals do not carry an appreciable quantity of immune antibodies. In acquired immunity it is probable that the latter predominate. Animals may also be naturally immune because bacteria cannot find in them a suitable medium for multiplication.

In the attempt to immunize artificially with vaccines, it becomes necessary to determine what enables bacteria to establish and maintain themselves in the tissues. If it is through toxin production as in diphtheria, the vaccines must contain the toxin rather than the bodies of the bacilli. If it is through the building up of a resistant membrane or of capsules it is obvious that we must have them in our vaccines to stimulate properly directed immune reactions. It is highly probable that we might dispense with most of the body substance of the bacteria since this comes into play only secondarily, and later in the course of the infection, and yet may be sufficiently injurious in vaccines to interfere with the immunization in part or wholly.

There is another type of parasite which may dispense largely with both offensive and defensive processes. We can conceive of this type as exerting a metabolic activity approximating so closely to that of the host that the latter reacts but slightly, and then only after a long period of stimulation. This type of parasite would have very little that is body-foreign or blood-foreign.[7] In this latter class I would place such organisms as the spirochete of syphilis. If the exquisite, prolonged parasitism of this micro-organism, the relatively slight lesions and their curability, be borne in mind, it will be understood why I place it in this category.

Medical science has shown that it is relatively easy to immunize against the soluble toxins of diphtheria, tetanus and botulism, but that it grows more and more difficult as the defensive elements increase and the toxic elements tend to disappear. To immunize against parasites whose metabolism produces little reaction on the part of the host should be most difficult of all.

When we glance over the literature dealing with fundamental problems of immunity, we soon come to notice that our theories have been built up somewhat narrowly on studies of special diseases. The behavior of the cholera spirillum and, to some extent, of the typhoid bacillus in the guinea-pig, has been drawn on by R. Pfeiffer and his pupils very largely in constructing his theories. It is admirable work, but it can scarcely tell us much about immunity in pneumonia or tuberculosis. The structure and functions of these organisms are so different from that of the cholera spirillum, and their behavior in the body so divergent, that each must be studied by itself. This has been done on a large scale in recent years, and the place of the opsonins and tropins with reference to phagocytosis placed in proper relief.

Bessau[8] has recently presented again the views of Pfeiffer and his school with reference to immunity against the typhoid bacillus. He also takes up the question of the immunizing and the toxic characters of vaccines, and comes to the conclusion that a successful vaccine cannot eliminate toxic effects. He compared several methods of preparing vaccines. An intensive extraction in salt solution at 58 C (136.4 F.) yielded a vaccine ten times as strong in immunizing power as the extract prepared by using Brieger's method of shaking the culture. The residue of the salt solution extract was practically devoid of immunizing substances. These results would indicate that toxic and immunizing substances in the typhoid bacillus cannot be wholly separated. The last word has not yet been said, however, for we do not know enough about the means of separating the constituents of the bacterial cells and we cannot quite accept in its entirety the result of experiments on an animal practically immune to the invasion of the typhoid bacillus.

In presenting in this very hurried way a hypothesis of the reciprocal relation between pathogenic micro-organisms and their specific host, I simply wished to emphasize the importance of studying every infectious disease by itself, and not accepting any one theory in regard to the toxic and immunizing properties of bacteria, since they exist in a different ratio in every specific disease germ, and their relation to the process of immunization may not be the same for any two infections. Before medical science shall have solved the problem of vaccination by the use of purely immunizing substances, provided the theory on which their existence is based be true and the technical difficulties not too great, we shall have to content ourselves with the bacteria themselves. Some added difficulties in their use need still to be discussed.

DIFFICULTIES ATTENDING THE USE OF VACCINES

Cultures of bacteria to be used as living vaccines must of necessity be so reduced in virulence as to induce a type of disease which is only a feeble reflection of its original. The ideal would be a culture so modified as to multiply without causing temporary or permanent injury. When vaccines from dead bacteria are to be used, the latter should have been endowed, before they are killed, with all the potencies with which they maintain themselves in the body. These potencies do not remain unchanged during artificial cultivation. The deterioration they undergo is more conspicuous with some bacteria than with others. The tubercle bacilli, notably of the bovine type, may become very materially altered when they are cultivated, so as to produce a large crop convenient for commercial purposes. The capsule bacteria lose their capsules promptly. All cultures which can be accurately tested—and this is possible only with those from animal diseases—undergo a decided loss in virulence. Some pass through a sudden transformation in the first culture. Our ordinary culture mediums carry on a more or less selective activity, weeding out those which fail to multiply promptly. All these changes are evidently significant, but our unstandardized methods and the impossibility of testing the viruses on the original host, in the case of man, prevent us from gaging this significance accurately. In the absence of more definite knowledge, our theory demands that our vaccines be composed of bacteria as little changed as possible. Yet in preparing vaccines on a large scale, this demand cannot be fulfilled. Only in the use of autogenous vaccines is this condition fairly well met. Some writers go so far as to assert that highly attenuated typhoid bacilli make the most efficient vaccine.

There is yet another difficulty encountered in preparing vaccines on a large scale, which is due to the existence of variants among cultures of the same species. The variations found are chiefly serologic in character. Their agglutinins, for instance, may be different. The immune serums produced by the injection of one strain

7. It would then approach, in character, such cells as the polymorphonuclear leukocytes, which go to any part of the body. Yet even they possess injurious properties, for if they collect in large numbers as pus, Opie has shown that their specific ferment, leukoprotease, will liquefy tissues, because unrestrained by an antibody contained in the blood plasma.

8. Bessau: Berl. klin. Wchnschr., 1912, p. 2210.

may not protect against another strain, as shown by Neufeld for the pneumococcus. It is possible that in the future inclusive strains may be found to overcome this very real obstacle.

The foregoing conditions refer to the parasite. There are a number of conditions affecting the host which influence the success and stability of vaccinal immunity. These must not be lost sight of, if the best devised vaccination is not to be condemned.

From many experiments on animals we know that immunity is relative and not absolute in its protection. In testing the degree of resistance acquired, we find that a large dose of virus may break down an immunity which will resist a smaller dose. A more virulent strain of the same microbe may easily overcome a resistance successful toward weaker strains. The mode of inoculating the test virus is of great importance. Immunity toward a subcutaneous dose may fail completely to protect against a much smaller intraperitoneal dose. Römer, and following him Tomarkin, were able to show a sustained resistance of moderately tuberculous guinea-pigs, toward a fresh cutaneous inoculation. A similar immunity toward a subcutaneous dose, so far as I know, has not yet been demonstrated.

It is evident that human beings, supposedly protected by vaccination, may at any time encounter highly virulent races, or take in unusually large doses of ordinary virulence. The portal of entry may also be different and less secured than the usual route. Such accidents tend to bring discredit on vaccination, and they show that we cannot dispense with the usual preventive measures even in a thoroughly vaccinated community.

It is now well known that vaccination protects only for a limited period. The body forced to produce a variety of antibodies under pressure is not likely to continue such manufacture indefinitely after the stimulus is removed. Nature is not lavish in producing unused commodities. Animals naturally immune do not carry an appreciable quantity of immune bodies about. Their protection is guaranteed by more economical processes of life of which we know as yet very little. The length of time elapsing between vaccination and exposure, therefore, is of great significance in the success or failure of protection.

There is still another series of factors which may be called environmental which play a prominent part in immunity. Thus, seasons govern the incidence of many infections. Pneumonia and its allies are largely subject to seasonal influences. Restricted and special kinds of food, which are gradually being exposed as a cause of many constitutional diseases may greatly favor, through these diseases, the lodging and multiplication of infection. The strain due to bodily exertion and exposure to cold may start infection already present somewhere in the system. These and other environmental influences become so important in endemic diseases that they take first rank, the micro-organism falling to second. The normal immunity of the body is so high that the mere presence of the infecting organism is not enough. The immunity must first be broken down by exposure, exertion, hunger, fatigue and so on. What can we expect of vaccines against such diseases? Can they counteract the depressing influences of environment? These questions are still to be answered. If pneumonia is amenable to preventive vaccination, why is this not accomplished by the virus in the upper air-passages, where it vegetates in the majority of persons?

In addition to these many variables of host and parasite which may influence either the success of the immunizing process as such, or the conditions under which it is most efficiently put to the test, there is the principle of active immunization itself which must be carefully kept before us. When we discuss vaccination as a preventive, we mostly fail to take into account that we are asking something of the individual to be vaccinated, rather than giving him something. We are asking his tissues to go through the preliminary process of training to meet some future emergency. Vaccination is a process of education, for being better prepared to meet an invasion at once, before it has grown to any dimensions. We have no reason to suppose that the characteristics of the body will be materially and permanently altered by such a training. If the body is below par in the supplying of immune bodies, it is likely to remain so, despite the vaccination. Of two individuals treated preventively alike, one may be able to cope successfully with a larger or more virulent dose than the other. The plane of immunity of both is raised by vaccination, but unequally so, and in proportion to their natural endowments. Experimentally, we find this difference among all our animals. It is strikingly illustrated by the widely different capacities of horses under the same treatment for the production of antitoxins.

TIME RELATIONS OF VACCINATION AND DISEASE

Having now discussed some of the facts and theories pertaining to artificial immunization and some of the practical difficulties, I have still to consider the time relations of vaccination to the disease process. Vaccination before infection or preventive vaccination is the simplest and oldest application. It is now used quite universally as a general prophylactic against small-pox. Vaccination against typhoid is gaining ground. Vaccination against other infections such as diphtheria may come if other means of prevention fail to control the infection properly. Of small-pox vaccination little need be said. Although the public is growing somewhat restive under compulsory vaccination the method in use still stands unique, and if properly administered and duly supported by the public its benefits cannot fail to be great. If hampered, however, by legislative restrictions and by public indifference, it cannot assert its efficacy.

The vaccination against typhoid fever is just now receiving much attention. It appears to be harmless and should have the widest application if only to give it a thorough test under varying conditions. We should not, however, be so optimistic as to lead the public into thinking that the usual precautions may be neglected with impunity. The recent Army statistics are encouraging but they cannot be compared with those of the Spanish War camps, for example, in which the opportunities for the dissemination of infection were very favorable. Such conditions will probably not be reproduced again, and wherever vaccination goes there will also go a better insight into the disease on the part of the public and better means for suppressing the infection. The possible dose of infection will thereby be greatly reduced, and even a slight vaccinal immunity may prove effective against the natural infection. Therefore vaccination against typhoid should not take the place of and make unnecessary all those precautions which have hitherto been held as essential in combating it. There will continue to be still enough unrecognized infection about which will increase with density of population. For similar reasons it seems unwise to remove quarantine against small-pox even in a vaccinated community, which has been done by some states.

In tuberculosis the frequency of childhood infection has been regarded by Römer and others as a kind of protective vaccination. The modern theory of phthisiogenesis regards this early infection as a Janus looking either toward immunity in later life or toward an open progressive malady. If childhood is absolutely protected, infection will come later. If it is exposed too much, disease is sure to come. In this dilemma perhaps the safest position to take is that even with great care in preventing infection there will still be enough infection at large to keep the young immunized.

VACCINATION DURING THE COURSE OF INFECTION

If the procedure of injecting vaccines when the body is manifestly under the influence of the injecting agent had been presented fifteen or twenty years ago, it would have been met with skepticism and failure. It was assumed that the body is already fully occupied trying to rid itself of intruders, and that any further addition of micro-organisms would do harm rather than good. Pasteur had introduced a method for immunizing against rabies after infection and before any open manifestations of disease. It was reserved for Koch in 1890 to introduce the method of vaccinating during disease by the use of tuberculin.

In 1902 Sir Almroth Wright began his work in treating chronic bacterial infections with vaccines consisting of suspensions of bacteria killed by heat. In introducing this mode of treatment Wright associated with it the rise and fall of particular normal substances in the blood, the opsonins. These, by acting on bacteria, made them a more ready prey of phagocytes. Wright at first limited his treatment to localized bacterial infections. Only later did he attempt to influence infections associated with bacteriemia and other indications of an active, generalized process.

This invasion of the precincts of active disease by clinicians with their vaccines has been viewed with much interest and trepidation by bacteriologists. It seems like adding fuel to the flames. But there may be unknown factors in the path leading toward immunity which the bacteriologist has not yet sensed. The clinical conditions attacked by vaccines are not easily studied by experimental methods. In the laboratory, investigations on immunity have been largely and of necessity restricted to virulent organisms. The end-point of the experiment has usually been death or recovery. The animal in order to be saved had to be hyperimmunized, and the final result is a condition to be realized only by experimenting on highly fatal human infections.

Localized bacterial infections are processes toward which the human body in general possesses a high degree of natural resistance. This group of infections forms theoretically but a small local side-issue of the problem of immunity—that end of it tending toward recovery. It is but a step removed from the carrier problem. The great service of vaccines in this group of diseases lies in the fact that localized bacterial infections are exceedingly common and represent in most cases an annoyance and an infirmity rather than a danger to life. It is well to bear in mind this difference between laboratory studies in immunity and Wright's studies. His work begins where that of the laboratory ends. Local lesions in animals under decent conditions usually heal quite promptly and do not engage the attention of the experimenter to any extent unless they are induced in a healthy animal for special purpose and represent the starting-point of a general invasion to be checked by appropriate experimental devices. Therefore experimental medicine is not in a good position to study immunity toward localized infections. Spontaneous cases in animals would be difficult to obtain in any numbers, and the production of artificial local infections would have to be associated with induced wounds.

How different Wright conceives his problem from the ones usually studied in the laboratory is gathered from the following quotation.[9] In discussing the concentration of bacteriotropic substances and phagocytes in the blood he says:

> It is, in view of these considerations, immediately intelligible that the animal organism should, as it does, successfully resist microbes administered through the channel of the blood, when it fails to offer resistance to the self-same microbes, administered by the way of the tissues.

The bacteria usually employed in laboratories are of such a character that infection by way of the blood is the most serious, by way of the subcutis less dangerous, and by way of the cutis least dangerous. If we attempt to immunize a rabbit toward a highly fatal strain of the rabbit-septicemia group we may eventually succeed in protecting it against a dose of virus rubbed into the shaven skin to which the control succumbs. A subcutaneous injection, however, may not be borne, and least of all an intravenous dose. The artificial immunity produced tends to restrict the virus to as limited a locality as possible. Its very end seems to be to keep it out of the blood. The rabbit stands in the place of a human being with local plague infection which has been held in check by a high degree of artificial immunization effected before the disease appeared. Would any one risk the injection of vaccines in a case of this kind to hurry along the healing of the local focus? When, on the other hand, we have a local infection with a staphylococcus against which the human race has been successfully fighting for ages and toward which a high degree of immunity already exists, the injection of vaccines in small doses has little if any bearing on the restriction or dissemination of the virus in the body. In the case of the plague lesion the acquired resistance may be broken down at any time by one of many accidents including vaccination. In the staphylococcus infection this is very unlikely.

Wright has fully appreciated the significance of localized bacterial infections as they usually present themselves in the human subject. According to him they are some miscarriage of the processes tending toward the complete elimination of bacteria. He proposes to help the affected locality by various measures such as increasing the flow of blood and lymph, free incisions and, by vaccination, to call forth and bring to the spot an increased supply of immune bodies, that is, opsonins and leukocytes. Without wishing to question the general accuracy of Wright's brilliant observations on localized infections, we might venture to enquire whether many such infections are due to lack of immunity at all. May not these miscarriages as he calls them be due to a slight disarrangement of the immune forces in their attack? If, for example, as he states, "a wound may be pouring out day by day an ineffective pus," would not a local vaccination tend to withdraw some of this "ineffective" pus to itself and restore the balance? In those cases of "brawny swelling" in which there are too few leukocytes and too much serum, may not the free incision give the pent-up bacteria a better chance to multiply in the open wound and thereby stimulate leukocytes to the spot to

9. Wright: Studies in Immunization, 1909, p. 453.

form pus and thus restore the balance in the opposite direction?

These questions indicate that at least some localized infections may be due to disturbances of a delicate equilibrium rather than to a deficiency of immunity as we usually understand the term. It is of interest to note here that in such cases vaccination is after all merely a safer and surer way of doing something which the setons of former centuries did in an unsafe and less certain way. If the seton wound became infected with the right organism, which might happen through the blood or by accidental infection from the wound, the vaccination became a continuous process, and an outlet for "superfluous" leukocytes was made while the immunity was being raised.[10] The non-specific fixation abscesses of the French may perform a similar service.

The treatment of bacteria-carriers with vaccines requires no special comment. The carrier is as a rule immune, and with the application of reasonable doses of vaccine harm can hardly be done. Whether or not such treatment is going to be effective must be determined on the patient himself. If the attempt to create experimental material by making animals artificially carriers should succeed it would serve as valuable material for chemotherapeutic studies. But it is doubtful if such animals treated with vaccines would give us any final knowledge concerning the application of vaccines to human carriers. The attempt to make rabbits typhoid carriers for purposes of experimentation with vaccines is at best producing a greatly distorted image of human conditions. The relation between the rabbit and the typhoid bacillus is purely artificial. It would be better to try a paratyphoid toward which some spontaneous susceptibility is known to exist.

Vaccines are now employed in affections in which the specific agents can be frequently detected in the blood and in which symptoms indicate that the infection is no longer strictly localized. They have been applied in the course of typhoid fever, pneumonia, puerperal sepsis, general streptococcus infections, gonorrheal metastases and the like. Is there anything in the armamentarium of bacteriology and immunology that can be used to defend and encourage this form of vaccine therapy? Is there anything to forbid it?

Medical science is here again at a disadvantage because the types of disease mentioned are not exactly reproducible in the laboratory. The feature in them which attracts attention is the presence of bacteria in the blood, either constantly or spasmodically. This condition of bacteriemia has perhaps been regarded as of more serious import than it really is. In the laboratory the bacteriologic conception of septicemia implies certain death for the reason already stated, that bacteriologists are in the habit of using only highly virulent organisms which produce speedy blood infection. Such types of disease must not be identified with infections which last many weeks and months and are associated with, let us say, streptococci in the blood. In the latter case the streptococci may be mere passersby, ready, it is true, to do damage wherever a favorable nidus offers, but probably not multiplying to any extent in the blood-stream or outside of protected foci within organs. To make my statement clear let us take an extreme illustration, the presence of myriads of microfilaria in the blood, in filariasis. This condition is also a septicemia, but the metabolism of the nematode larvae is of so little offense to the host that no appreciable reaction is produced and the patient remains well. With trypanosomes the situation is more serious. The other extreme is the plague rat or similarly susceptible animal in which the blood is apparently the favorable tissue for multiplication. Between these extremes various intermediate degrees of blood-infection occur depending on the rate of multiplication of the parasites in the blood. Again bacteria may even remain latent for many months in organs associated intimately with the blood such as the spleen, or at any rate multiply so slightly that the inoculated animal remains well. Marshal Fabyan,[11] working in my laboratory, has shown that the bacilli of cattle abortion may be cultivated in considerable numbers from the spleen of various laboratory animals many months after inoculation, without causing in the meantime any appreciable symptoms or lesions. These illustrations must suffice to show that the presence of parasites in the blood or blood-forming organs may have various meanings.

Returning to the cases of bacteriemia which have been found to persist many weeks in association with some local focus of infection, can we safely superpose on this condition dead bacteria of the same kind and, if the procedure is safe, is it beneficial? We have Wright's statement followed by that of many others, that in such cases great benefit from the use of vaccines has been observed occasionally. It is not within the scope of this discussion, however, to do more than suggest some theory which may harmonize to a certain degree opposing views of immunologist and clinical vaccinator. The point of view I wish to present is that the bacteria in chronic localized infections which spread into the blood may be immune or fast (to use Ehrlich's term), so that they are neither destroyed nor capable of much increase. Their defensive mechanism is highly developed, either because they are special, highly parasitic varieties or else because a long-drawn-out habituation to a particular host has made them so. With this goes also very slight multiplication. Hence little bacterial substance is set free to cause serious injury or to stimulate immunity. The injection of cultivated bacteria which are of a much lower grade of resistance, in the form of vaccines, may perhaps supply the needed stimulus and raise the immunity to that level from which the parasitic forms may be successfully attacked.

There is an apparent contradiction between this explanation or theory and the one I have presented earlier in this article. I stated there that to produce a maximum immunizing effect bacteria should be as near their original parasitic state as possible, so as to be endowed with all the antigenic properties which they possess in the host. Here on the contrary I assume that in combating long-drawn-out bacterial infections we need vaccines not so resistant as their originals in the blood. But it will be remembered that the first demand referred to prophylactic vaccines. The body has then ample time to work over the vaccines and by prolonging the assimilation, a higher degree of immunity is to be expected. In vaccine therapy, however, the vaccine must be utilized by the body at once.

It is obvious that from what has been said vaccination in the course of disease is not a matter to be taken lightly. Each case presents its own peculiar problems which must be studied not only that vaccines may achieve a possible success but that they may do no harm. The one who administers vaccines or advises their use should

10. It should be added that the seton vaccination was a vaccination with living bacteria and therefore more effective provided the "autogenous" organism gained access to the wound, maintained by the seton.

11. Fabyan, Marshal: Jour. Med. Research, 1913, xxiii, No. 1.

have thorough training in experimental and comparative immunology. Not only should he be on terms of intimate personal acquaintance with the facts and theories of infection and immunity, but he should also be a practical bacteriologist and know how to prepare and evaluate the vaccines to be used. I therefore agree with Wright that we need vaccinators who should be specially trained and work in cooperation with the clinician. We can hardly expect a physician to be both a vaccinator as defined and a skilled all-round clinician, but we can have cooperation of two men sharing the responsibilities involved in these lines of work.

THE COMMERCIALIZATION OF VACCINES

In view of the difficulty of deciding when a vaccine may be used, and the necessity for estimating in each case the probable immunity already possessed by the patient from data obtained from the history of the case, from bacteriologic and clinical observations, the wide-spread commercialization and indiscriminate use of vaccines are to be viewed with considerable misgiving. From one of the most delicate problems the injection of vaccines is being brought to the level of a crude patent-medicine cure-all. Even with the greatest care in administration, there is still plenty of empiricism bound up with the use of vaccines as long as our knowledge of immunizing and toxic factors remains incomplete. The overburdened physician is ready to substitute some other responsibility and authority for his own, and commercial interests are but too ready to assume it.

The recent introduction of mixed vaccines is a case in point. The practitioner takes this vaccine and feels confident that it will hit something in his patient's condition. In addition to the unscientific use of mixtures in which the ingredients, if they act at all, not only may act alone, but also may combine to produce unanticipated results, the injection of mere filtrates cannot be supported from a scientific point of view. Filtrates may contain the toxic, or offensive, rather than the immunizing properties of cultures. They are known to contain endotoxins. We know from laboratory tests that fluid cultures increase in toxicity with age, that each species has its peculiar toxin curve, that toxicity depends on slight differences in culture mediums arising from the kind and quality of meat used, the amount of sugar present, the initial reaction, the relative exposure of the fluid to the air during multiplication, and the age of the filtrate. All these would require, in any case, most careful standardization. There is no evidence to show that even if such mixed vaccines were of maximum immunizing power, a single or even a series of injections would prevent secondary or mixed infections. The incidence of secondary or mixed infections during the course of a primary infection is probably beyond the reach of any dose of vaccine we can safely give. It means the breaking down of natural barriers of immunity of which we have as yet no very clear understanding.

The wide-spread use of bacterial products in therapy, more particularly in our own country to-day, signalizes that the empiric has far outstripped the experimental movement. This has always been so and will probably continue. The great pressure brought to bear on the medical profession to find something that will cure disease, even if the cure seems like making water flow up hill, has tended to develop the haphazard, adventurous and empiric at the expense of rational, scientific methods of investigation.

But we cannot eliminate empiricism wholly. We owe valuable suggestions and discoveries to it. These are like clearings in the forest unconnected with other clearings but destined to become the nucleus of a healthy scientific growth. There are so many complex factors in biology with which we must deal and which at present defy further analysis, that a scientific empiricism is needed to deal with them. We should not have antitoxins to-day if we had waited for the orderly development of our knowledge from the normal proteins of the blood to the immune antibodies.

There is a wide margin, however, between conservative empiricism based on and starting from all available scientific data, and a radical program which throws them to the winds and proceeds in defiance of well-established doctrines. Our position toward this radicalism should be governed only by humane considerations. The medical profession should see to it that vaccine therapy does not degenerate into inconsiderate and reckless experiments on human beings, that it does not create false hopes in hosts of patients, and that it does not originate and end in commercialism and the desire to exploit the weak and unfortunate. To prevent these calamities, several lines of action are open. We should begin by influencing the student. Courses should be modernized so that through experiment and personal observation he may gain a more thorough grasp of the scientific method and a critical attitude toward old as well as new doctrines governing prevention and treatment. Your president, Dr. Richard M. Pearce, has made a splendid beginning in raising the teaching of pathology from the old, descriptive and static to a new dynamic level. His example should inspire others to do likewise.

In laboratory research we should not follow new and untried leads to the detriment of old work undone. We are too much interested in sudden and unexpected turns of the road we are traveling and loth to walk the long straight, uninteresting road which usually follows some important discovery. In immunology we are neglecting quantitative studies to hunt for new and somewhat spectacular events. We must approximate our laboratory work more closely to human problems, rather than stop where they begin. To do this we must study genuine animal infections, more in detail, and attempt the production of such diseases experimentally as will illustrate not only the beginning, but various other portions of the immunity curve. We shall then be able to estimate more wisely and promptly the true value of innovations. We have the solemn responsibility of avoiding such doings as may encourage the future quack. The charlatan of to-day simply flourishes on the harvest sown unknowingly by the profession of a former generation.

SUMMARY AND CONCLUSIONS

In conclusion, let me briefly summarize the points to be emphasized. All parasites tend to increase the resistance of the host in which they live and multiply. Out of this universal fact a number of practical problems arise. In any given disease is it worth while to try to raise this immunity, and how much energy will it cost the patient? If worth while, what is the best and most sparing way of raising such immunity artificially? In any localized infection we must ask: Is this a beginning process without attendant immunity, or is it a residual process associated with general immunity? If the latter, vaccines may be considered safe. In processes associated with fever and bacteriemia, scien.. says Hands off until we know whether we have a progressive disease with gradual undermining of the resistance or a more localized affection in which the excursions into the blood are secondary. In any case, the use of vaccines in these

cases must be regarded as experimental, and should not be undertaken save in conjunction with one trained in immunologic problems.

Judged from this point of view, as well as from the work of the laboratory as a whole, we should say that vaccines applied during disease will be rarely, if ever, life-saving, but they may hurry a stationary or languid process which tends toward recovery, by bringing into play the unused reserves of various tissues.

240 Longwood Avenue.

A PLEA FOR AN INSTITUTE OF HUMAN EMBRYOLOGY

FRANKLIN P. MALL, M.D.

Professor of Anatomy, Johns Hopkins University

BALTIMORE

A superficial glance at the facilities for the study of anatomy suggests that the great number of specialists and students of this subject should suffice to insure an effective organization of the forces to promote the science in a satisfactory way. In fact, the forces are well organized through well-equipped laboratories, national and international societies, well established journals and the very best year-books. All this is due to the popularity and usefulness of the science during many ages, but it is easy to discern that much is still needed before the newer science of anatomy can be cultivated more effectively.

The parallel science of astronomy has in many respects a similar history to that of anatomy; it is also practical, popular and ancient; it has had its Hippocrates (Hipparchus), its Galen (Ptolemy) and its Vesalius (Copernicus); but its organization for research differs distinctly from that of anatomy. There are fewer astronomic observatories than anatomic laboratories, and fewer astronomers and students of astronomy, but unlike the work of anatomists, that of a large percentage of the astronomers is of a very high order. Should we not pause for a moment and ask ourselves whether the science of anatomy would not be furthered better and quicker if the example set by astronomy were imitated? In his "Advancement of Learning" (Book 2), Bacon says:

> I take it those things are to be held possible which may be done by some person, though not by every one; and which may be done by many, though not by any one; and which may be done in a succession of ages, though not within the hourglass of one man's life; and which may be done by public designation, though not by private endeavor.

It is the last portion of Bacon's statement which points out the way. We should have anatomic institutes for research, not in a vague way, as in the universities, but for specific investigations which are beyond the reach of a single individual or university department. In universities most of the time and energy of the teachers of anatomy must necessarily be devoted to education, and this effort is beneficial to the individual investigator, as it compels a broad stand to teach successfully the elements of any science. Under these conditions the professor can not make a sinecure of his position. But the devoted teacher has left only the minor portion of his time for study, and the progress of science necessarily stagnates. If the real anatomists devoted all of their time to science, and cooperated in their work, would they not make greater progress than is now possible?

The second half of the last century witnessed the building of a very large number of laboratories in various universities and this naturally called for more investigators and teachers in each science. A greater demand for scientific achievement naturally followed, and a larger percentage of teachers who were also investigators made their appearance. While it will always be the case that many problems will be solved by unaided individuals with practically no equipment, organization for more elaborate problems will favor and extend their efforts and not antagonize them. There is an ever-growing tendency for the able investigators to call for more eyes and hands to help, and above all these will find the atmosphere in research institutes congenial. So in recent years investigators, governments and benefactors have seen more clearly than ever that men of ability should be endowed in order that science may profit most by their efforts. As a simple statement this is self-evident—to carry it out is by no means easy—but the opportunity it describes has called forth a new type of high-minded, far-sighted administrators whose success so far guarantees much greater success in the future.

An abundance of experience has shown that an institute for research must be in charge of an investigator of a high type, and that the function of the institute should be sharply defined in order that the effort may be of value instead of a hindrance to science. For if a research institute is misdirected, as regards scientific achievement, a bad example is set which has a tendency to prevent other worthy efforts. So when the Reichsanstalt was founded, an enlightened administration placed Helmholtz at its head; the International Association of Academies chose His as first leader of the Brain Commission; the Rockefeller Institute found Flexner; and Hale was secured for the solar observatory. Selections like these inspire confidence in research institutes, for by their acceptance great leaders declare that the efforts are worthy.

The Naples Zoological Station served as a great stimulus to biologic and embryologic research, for it gave a new outlook to cloistered investigators by bringing them together at the seaside. The leading anatomist of his day, His, was greatly impressed by a sojourn at this station and later, when the opportunity arose, he made a plea for a research institute of human embryology as well as for one of neurology. The great man asked too much of the International Association of Academies, but it sanctioned a commission on brain research. His was made president of this commission, but death prevented him from contributing more than the outline for its organization. Since then the commission, now known as the Brain Commission, under Waldeyer's leadership, has been instrumental in bringing into existence, or into the commission, nine well organized laboratories in different countries. The Brain Commission is a society of neurologists under control of the Associated Academies; its chief function has been to found neurologic institutes; it meets triennially and its report is submitted a year later to the academies.

The second project of His, namely, that an institute of human embryology be founded, was referred by the Associated Academies to the anatomic societies. At the meeting of the German Anatomic Society, held in Bonn in 1901, a committee was appointed, composed of His, Waldeyer, Keibel and Rabl, to arrange for cooperation in embryologic research, but it developed no activity. Nor was this question considered by the first Congress of Anatomists in Geneva in 1905. At the second session of this congress, held in Brussels in

1910, however, a committee was appointed to revise embryologic nomenclature. It may readily be seen that this committee, if it secured the endorsement of the Association of Academies, could easily accomplish for human embryology what the Brain Commission has done for neurology. Shortly after the appointment of the Brussels committee a self-appointed committee of three called a meeting at Utrecht to organize an International Institute of Comparative Embryology, which is composed of forty members, including all of the Brussels committee. This continued agitation shows that it has become a recognized fact that embryologic investigation needs international organization to further the science. The object of the Brussels committee is to revise embryologic terminology, and the Utrecht conference plans to make extensive collections of embryos of all classes of vertebrates; neither is to confine its field especially to human development. In the study of human embryology there are specific problems of great scientific and practical value which, on account of the nature of the question, cannot possibly be studied to the best advantage without more concentration of energies (including carefully outlined cooperation) than is planned by either the Brussels or the Utrecht committees. In a measure this has been done without financial aid in producing the "Manual of Human Embryology," generously published in German by Hirzel of Leipsic and in English by Lippincott of Philadelphia.

We must thank His for the first attempt to study carefully the anatomy of human embryos, but his work was planned on so large a scale that he never completed it. Gradually he lost courage to go ahead singlehanded, as may be observed in his numerous publications in favor of cooperation in embryologic research. Thus we may trace back to him the incentive for Keibel's *Normentafeln,* Minot's great collection of vertebrate embryos and mine of human embryos. Although I have stated that the Bonn Committee was inactive, plans were made by His and Keibel to cooperate in the production of a work on human embryology as a continuation of "Die Anatomie menschlicher Embryonen." Unfortunately this did not materialize, but in its place we have the manual mentioned above. To produce these two large volumes nine American and six European embryologists have collaborated to bring together what is known about the developing human embryo. In the preparation of this work the human embryos, which have been prepared for investigation in various laboratories, have been studied wtih considerable care. But there are not many embryos in the total of all the collections; many of them are poorly preserved or prepared; their histories are usually inadequate; and most of the embryos are difficult of access. In spite of all of the disadvantages this manual gives, aside from the very early stages, a more complete account of the topographic and systemic development of man than we possess of any other animal. At present it seems impossible for the investigator-teachers to make greater progress than is here shown without better organization, and it is for this reason that I renew the plea of His for an institute of human embryology. Only in this way can we hope to secure a complete embryologic and scientific basis for human anatomy, which, it is being recognized, is in a chaotic state. In human anatomy, whenever an organ has been studied embryologically, many obscure and involved conditions have become clear, and in many instances this has aided the study of comparative embryology and comparative anatomy. Although this should not be the case, it is true, because the detailed anatomy of man is better understood than of any other animal, and the study of the human embryo therefore has the greatest value. I need only to cite His' studies of the heart and brain to support this statement.

The science of anatomy, which in great measure has been a mother of the biologic sciences, needs a thorough revision and a new basis, and this is to be obtained through the study of embryology. There should be an institute of human embryology just as there is one for human paleontology recently founded in Paris by the Prince of Monaco. To do this the following is required:

1. Much larger collections must be made.
2. Much better histories of the various specimens must be obtained.
3. The necessary material must be placed at the disposal of the most competent investigators.

The collection in Baltimore includes five hundred specimens which have been accumulated during a period of twenty years. It contains about one hundred normal embryos cut into serial sections, of which about one-fifth are really good specimens ranging from 2 to 30 mm. in length. Although great care has been taken to collect good histories of these specimens, they are still fragmentary, and by no means as reliable and extensive as they should be. Since, however, the quality of the specimens and histories is gradually improving, there is every assurance that a much better collection could be obtained under more favorable conditions. This collection is the result of the efforts of one individual, largely unaided. The Leipsic collection was also made by a single individual during a period of thirty-five years. In scientific value it is probably inferior to the Baltimore collection, for it antedates it. Since the death of His the collection has fallen out of use; in fact, most investigators do not know what has become of it. The other collections, which are smaller and scattered, have been drawn on freely by Keibel for his *Normentafeln* and by Keibel and Mall for the "Manual of Human Embryology." This is our present state.

In a measure gynecologists and obstetricians have been educated to preserve embryologic specimens properly and it now remains for embryologists to collect them for study. This process is taking place all over the world, but the material is scattered and of insufficient quantity. A vigorous institute, properly related to the investigators of the world and to the medical profession of a number of larger cities, should bring together as many embryologic specimens in a year as under present conditions an occasional investigator does in a lifetime. Were this the case there would certainly not be a dearth of both normal and pathologic embryos for study. The histories of the specimens should be as complete as possible, for, besides their age, we should also attempt to determine the cause of abortion.

An unusually large collection in an institute of human embryology would necessitate the best scientific equipment—assistants, specially trained technicians, artists and modelers to work up the good specimens at once, and to record and carefully to care for all material. Competent investigators should be invited to the institute, rare specimens should be borrowed, necessary material should be loaned and small grants should be made to distant investigators for special studies. The institute should be an independent center of sufficient magnitude to play an important rôle in the study of human embryology.

At present a single investigator easily makes a collection of embryos which is far beyond his power to study systematically during a lifetime, and still such a collection is too incomplete to show in a satisfactory way the continuous development of any organ. Cooperation is required and the best technical aid is needed to apply to advantage the methods we now possess. The tens of thousands of sections must be reconstructed to show the form of the various organs and structures on an enlarged scale in order that we may make progress in routine work as is the case in astronomy and geology.

With a very large collection, a competent staff and the very best material equipment the institute would naturally take up problems which bear on anatomy, physical anthropology, comparative embryology, physiology of gestation, pathology and teratology. The following larger questions at once present themselves:

1. Curve of growth.
2. Anatomy of various stages.
3. Morphology of the brain.
4. Histogenesis.
5. Cause of abortion.
6. Study of monsters.
7. Study of moles.
8. Comparative and experimental embryology to elucidate human.

Some of the subdivisions of these larger questions are as follows:

1. The norm should be established; embryos should be arranged in stages.

2. Are all portions of the embryo equally developed in like stages?

3. The corpus luteum should be standardized in relation to stages of the embryo.

4. An attempt should be made to determine with precision the age of embryos.

5. To what extent do the stages of the embryo, their age and degree of development of the corpus luteum correspond? (These questions having a bearing on the time of fertilization, duration of pregnancy, and in rare cases on illegitimacy.)

6. All kinds of measurements of a physico-anthropologic nature should be made on the embryo and fetus, to ascertain if possible an explanation for marked anatomic variations. In certain portions of the body variations are more pronounced and more frequent than in others. This condition may be due to unequal development in early stages when there is much shifting of great masses of tissue.

7. Careful comparison of the degree of development in twins. Is the rapidity of development the same in the two sexes?

8. Does the health and nutrition of the mother influence development? Is there a critical point in early development which subsequently influences the physical and even the mental well-being of the individual?

9. A norm is to be established not only for the embryo but also for each organ, structure and tissue. Ultimately, it is to be hoped that such a study will give a norm for adult human anatomy, which at present is based on opinion. It goes without saying that such study would in the course of a generation or more give us a new and improved science of anatomy and a rational terminology.

10. Normal embryos are to be separated from the abnormal and the pathologic.
   A. A careful study is to be made of embryos obtained through hysterectomies.
   B. Through tubal pregnancies.
   C. Through artificial abortions.
   D. Through "natural" abortions.
   E. These various groups are to be compared with corresponding stages from other mammals.

11. In "natural" abortions the cause is to be investigated. To what extent is it due to syphilis, gonorrhea, or infection by the physician or the midwife?

12. The social evil probably plays a great rôle here. To what extent this is the case may possibly be determined by making collections in country districts as well as in cities. The frequency of abortion in two such districts would have to be ascertained.

13. The norm of the chorion must be determined anew.

14. Sterility in both the male and female.
   A. Tendency toward sterility.
   B. One-child marriages.
   C. Sterility after a number of births.

15. Abnormal embryos.
   A. Slight degree.
   B. Polysomatous monsters.
   C. Merosomatous monsters.
   D. Pathologic embryos.
   E. Moles.

16. In tubal pregnancies only the very early pathologic embryos are found or the very late kind. This deserves investigation.
   A. Nos. 11 and 12 above bear on this question.
   B. Monsters are caused by a diseased uterus. To what extent is this due to gonorrhea?
   C. Study monsters in other mammals; for example, in the pig.
   D. Imperfect implantation to be investigated.

17. The relation of human embryology to pathology.
   A. Tumors.
   B. Excessive and deficient development of organs and tissues.
   C. Embryonic remnants.
   D. Chromaffinic organs, etc.
   E. Pathology of the syncytium.

It may appear that the above outline emphasizes unduly the making of a collection, but this is not the intention, for in my opinion the chief function of an institute of human embryology should be the formation and solution of problems. To make the effort of great value it would be necessary to plan the work on a larger scale than is possible with the means now available. The laboratory space required and its equipment would be insignificant, but the funds should be sufficiently large to support properly a small staff with the very best technical and clerical assistants. The correspondence required would be extensive, a certain amount of traveling would be necessary, and grants should be made to insure the cooperation of several of the foreign embryologists.

1514 Bolton Street.

SPEECH WITHOUT A LARYNX

EDWARD W. SCRIPTURE, Ph.D., M.D.
Associate in Psychiatry, Columbia University
NEW YORK

Normal speech requires breath from the lungs acting on the larynx and the organs of enunciation in the throat and mouth. When the larynx has been removed without cutting off the supply of breath from the lungs to the mouth, the speech is like that of a very faint whisper. When the air-passage is entirely closed between the lungs and mouth, speech ceases entirely. Although the person can make all the movements of enunciation, he has no means of producing any sound. Strangely enough, however, he can be taught to speak quite audibly in a new way.

Several such cases have been reported, but I have recently had the opportunity to push the speech development much farther than anywhere reported by employing some of the finer principles of phonetics.

The patient came to me three months after his larynx had been removed for carcinoma. The passage from the mouth to the trachea was entirely closed. He breathed through a tracheal cannula.

To produce the explosive "p" he was taught to close his lips and compress the air in his mouth and pharynx by tension on the cheeks and in the back of the throat. On opening the lips there was a puff or explosion of the air that produced a quite unusually audible "p".

For "t" he placed the point of the tongue against the palate and compressed the air in the mouth and pharynx. The moment the closure of the tongue was released he produced a "t" that was more distinct than one produced normally. Just this same "t" is taught in one system of elocution; the speaker shuts his glottis tightly and compresses the air in the mouth and pharynx; this form of enunciation can be heard very far away in a large hall where the ordinary "t" would be inaudible. For "k" the back of the tongue is raised; otherwise the mechanism is the same.

For the fricatives "f," "s," "sh" (as in "shoe") and "th" (as in "thin") a narrow passage is formed between lips and teeth, tongue and palate, etc. For these sounds the air is furnished by mouth- and throat-compression just as for the explosives. All these sounds are made normally by pressure of air from the chest but without any action of the larynx; they are called "surds."

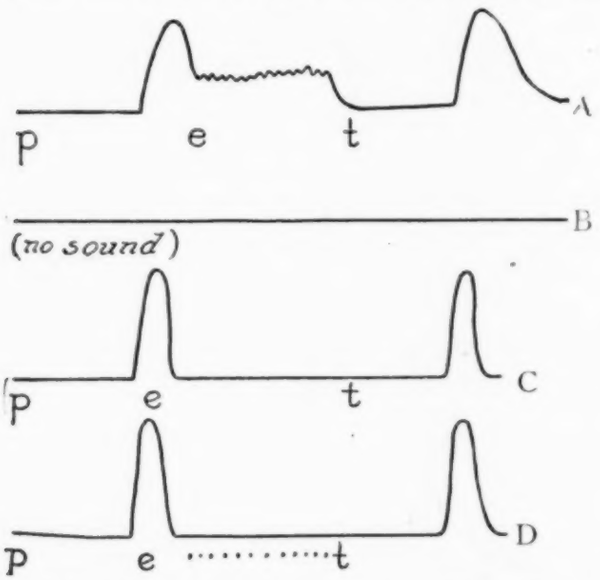

Fig. 1.—*A*, normal speech, showing occlusion and explosion of "p," vibrations of "e" and occlusion and explosion of "t." *B*, patient's speech before training; no sound although tongue movements were correct. *C*, patient's speech with pharyngeal compression; "p" and "t" distinct but only a faint brief vowel. *D*, patient's speech with pharyngeal compression and cannula hiss; interval of vowel is distinguished from silence.

For the normally made explosives, "b," "d," "g" (as in "go"), and the fricatives "v," "z," "sh" (like "s" in "pleasure") and "th" (as in "thine"), the larynx is required to vibrate. They are called "sonants." The positions of the lips, tongue and palate are approximately the same as for the surds described above; consequently, without the laryngeal vibrations there is no difference between "p" and "b," "t" and "d," "k" and "g," "f" and "v," etc., and it follows that "bed" sounds the same as "pet," "bag" the same as "pack," etc.

To make a difference that would replace the laryngeal tone I hit on the use of the air from the tracheal cannula. Any expiration produced a rushing sound. The patient was taught to produce a faint rushing sound during the production of all the sonants; this made a marked difference between the surds and sonants.

The vowels are formed by placing the lips, tongue and velum in certain positions. The vibrations from the larynx arouse resonance vibrations in the cavities of the pharynx and mouth. With no vibrations from the larynx, no spoken vowels can be formed. Whispered vowels are produced by a rush of air through the larynx. The rush of air through the pharynx and mouth when an explosive was ended by the patient gave an indication of the following vowel, but the sound was weak and brief and the vowels were not sufficiently distinguished from silence. To remedy this to some degree, the patient was taught to expire through the cannula for each vowel. The vowels were thus more clearly distinguished from pauses.

With the graphic method of recording speech, the person speaks into a tube ending in a rubber membrane. The movements of this membrane are recorded on a moving surface by a light lever. The record gives the vibration and puffs of air in the voice.

A record of "pet" spoken normally is given in the top line of Figure 1. The straight line at the beginning gives the time during which the lips were closed in making "p." As the lips were opened a puff of air was emitted; this blew the lever upward and made the sudden jump in the line. The vibrations of the vowel "e" were registered as fine waves. The closure of the tongue against the palate for "t" and the puff of air at its release made a record like that of "p." With no pharyngeal compression the patient produced no sound at all; the record is a straight line. (See *B*, Fig. 1.) With compression he made a record for "pet" like the normal one except that the vowel was a brief, faint whisper. (See *C*, Fig. 1.) By breathing through his cannula, the breathy voice replaced the silence. (See *D*, Fig. 1.)

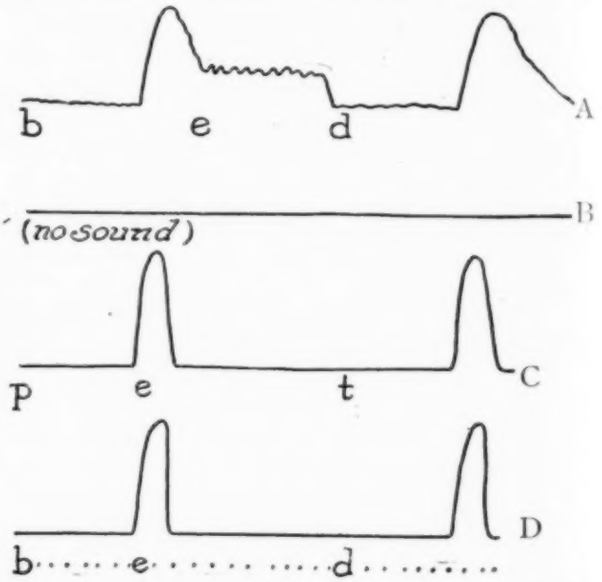

Fig. 2.—*A*, normal speech showing vibrations during "b" and "d." *B*, patient's speech before training. *C*, patient's speech with pharyngeal compression only; no difference between "bed" and "pet." *D*, patient's speech with pharyngeal compression and cannula hiss; the sounds are differentiated from the preceding case.

The top line of Figure 2 shows the normal record for "bed." The voiceless condition of the patient is indicated in the second line *B*. The enunciation with pharyngeal compression without the cannula-noise did not differ from that of "pet." (See *C*, Fig. 2.) The distinctness was much improved by using the breath from the cannula. (See *D*, Fig. 2).

The mechanism for each sound was explained to the patient. He found the work interesting and carried it out so very successfully that speech could be heard distinctly through two large rooms.

236 West Seventy-Fourth Street.

THE GERMICIDAL EFFICIENCY OF COMMERCIAL PREPARATIONS OF HYDROGEN PEROXID

P. G. HEINEMANN, PH.D.
Instructor in Bacteriology, University of Chicago
CHICAGO

Hydrogen peroxid has been recommended for germicidal purposes for many years. Its application has been advocated for rendering water and milk safe, for disinfection of sewage; it has been applied in medicine, surgery, dentistry, hair-dressing, etc. The chief advantage claimed for hydrogen peroxid over many other germicides is the fact that the decomposition products are harmless. It has also been claimed that toxins, such as diphtheria and tetanus toxins, are destroyed by it.[1] Its use for treating water and milk is, therefore, of considerable interest.

There are some objections, however, to the use of this chemical. It decomposes rapidly. The presence of small amounts of acid prevents decomposition to some extent. Some commercial preparations contain acids, acetanilid, or arsenic, barium salts, etc. The amount of acid, corresponding to about 0.2 per cent. hydrochloric acid, is perhaps harmless, and according to Croner[2] increases the germicidal effect. In neutral and alkaline solutions decomposition is rapid and keeping qualities are poor. According to Lukin,[3] alkaline solutions have higher germicidal power than acid solution.

Temperature is of importance in relation to the keeping quality and the germicidal efficiency of hydrogen peroxid. At 0 C. (32 F.) decomposition is slight and germicidal efficiency feeble. As the temperature rises decomposition proceeds more rapidly and germicidal effect increases. This fact involves a difficulty in application, since water and milk have to be treated at relatively high temperatures and then cooled to render them palatable. It is obvious that for sewage purification hydrogen peroxid is not likely to be successful, since the usual temperature of sewage is too low for its efficient germicidal activity.

Possibly more attention has been given to sterilizing milk with hydrogen peroxid than to any other phase of the subject. It may be added to milk either in solution or by using peroxids, which liberate H_2O_2. Solutions of the preparation are placed on the market by various manufacturers, the claimed percentage of actual H_2O_2 being 3, 4.5 or 30 per cent. Of metallic peroxids, sodium peroxid, calcium peroxid or magnesium peroxid has been used. Sodium peroxid produces an alkaline solution, so that the germicidal effect is feeble and deterioration rapid. Calcium peroxid has the disadvantage of liberating calcium oxid, and magnesium peroxid is not soluble.

There is no definite agreement among workers as to the exact minimum amount of hydrogen peroxid which will infallibly sterilize. Several factors have to be observed, and possibly failure to observe some one of these has caused the discrepancy in results. The reaction of the solution, the temperature at which the experiments are carried on, the presence of oxidizable substances, including enzymes, and the variability of hydrogen peroxid content in the solution have to be taken into account. The quantity of fat in milk is also a disturbing factor. Chick[4] has stated that skimmed milk requires but one-half the amount of this substance needed for sterilizing whole milk. Chick explains this by stating that catalases, which are present in milk and which rapidly decompose H_2O_2, adhere to the fat globules and are present in relatively small amounts in skim-milk.

Different germicides generally possess various degrees of destructive power toward different species of microorganisms. Hydrogen peroxid is no exception to this rule. Vegetative forms of bacteria seem to have less resistance than molds.

In 1903 Budde[5] proposed preserving milk by the use of hydrogen peroxid, a process that has since been called "Buddeising." Small amounts of hydrogen peroxid (12 c.c. of a 3 per cent. solution) are added to one quart milk at a temperature of 52 C. (125.6 F.). The milk is supposed to be sterilized in a few hours. Buddeising of milk, however, has not become popular for several reasons. The certainty that the majority of bacteria are destroyed by the process may encourage careless production. Another reason is that even in such small quantities as 0.1 per cent., according to Gordan,[6] hydrogen peroxid imparts a disagreeable taste to milk. Undecomposed remnants of hydrogen peroxid can hardly be avoided. Much and Römer[7] have attempted to overcome this objection by adding a catalase to the milk after sterilization by hydrogen peroxid has been completed. The remaining H_2O_2 is then decomposed by the catalase. A third drawback of Buddeising is the rapid and almost complete separation of cream. Finally, the uncertainty of commercial preparations renders results doubtful. If the milk were treated with a reliable solution of H_2O_2 on a large scale before bottling, good results might be obtained.

Benefits to be derived from Buddeising have been reported by some investigators. Thus Baumann[8] thinks that the process might be successful if the milk is produced under sanitary conditions, and Hewlett[9] asserts that Buddeising destroys 99.9 per cent. of all bacteria in milk. Böhme[10] considers Buddeising at least equal, if not superior, to boiling milk. According to this author the chemical and physical changes produced by boiling milk are not produced by Buddeising. It has not been shown, however, that hydrogen peroxid treatment leaves the milk constituents unaltered.

Solutions of hydrogen peroxid have gained considerable popularity. It is commonly used for a variety of purposes. The object of the investigation reported in this paper was to determine how far claims of manufacturers could be relied on for practical purposes. The exact amount of H_2O_2 contained in the preparations tested was determined, but not taken into account since it did not seem necessary to ascertain the exact amount of H_2O_2 which is required for complete sterilization. A bactericidal efficiency equal to the efficiency of pasteurization of milk requires much smaller amounts of germicide than are necessary for complete destruction of microorganisms.

The plan of the investigation was as follows: Commercial preparations were used in equivalent quantities according to the amount of H_2O_2 claimed by the manufacturers, with no regard to the actual amount present. Definite quantities were added to milk, water and suspensions of several species of bacteria. Bacteria were

1. Sieber: Ztschr. f. Physiol. Chem., 1901, xxxii, 373.
2. Croner: Ztschr. f. Hyg., 1909, lxiii, 319.
3. Lukin: Centralbl. f. Bakteriol., 1905-1906, xv, 20 and 165.
4. Chick: Centralbl. f. Bakteriol., 1901, No. 2, vii, 705.
5. Budde: Milchzeitung, 1903, xliv, 690.
6. Gordan: Centralbl. f. Bakteriol., 1904, No. 2, xiii, 716.
7. Much and Römer: Berl. klin. Wchnschr., 1906, xliii, 1004.
8. Baumann: München. med. Wchnschr., 1905, iii, 1083.
9. Hewlett: Lancet, London, 1906, i, 209.
10. Böhme: Deutsch. med. Wchnschr., 1906, xxxii, 1729.

taken from forty-eight-hour-old agar-slant cultures, and suspended in sterile water and sterile milk. Several suspensions of each organism were tested and by using from one to three tubes the density of the suspensions was varied.

Milk was tested in 1-liter (1-quart) flasks, each containing 250 c.c. Plates were made in beef-extract agar. The composition of the agar was as follows: 0.3 per cent. extract of beef, 1 per cent. peptone, 1.5 per cent. agar, and 1 per cent. dextrose. The reaction was 1 per cent. acid to phenolphthalein. The original number of bacteria in the milk was determined previous to the addition of the hydrogen peroxid solution. To one flask containing 250 c.c. milk, H_2O_2 was added in the proportion of 0.36 parts per thousand, to a second flask 0.72 parts per thousand, and to a third flask 1.44 parts per thousand. These quantities may be expressed in teaspoonfuls: For the 3 per cent. H_2O_2 solution there would be 3, 6 and 12 teaspoonfuls to each quart of milk, respectively. For the 4.5 per cent. solution of H_2O_2 there would be 2, 4 and 8 teaspoonfuls per quart. One part of the 30 per cent. solution was diluted with 9 parts of sterile distilled water so as to make a 3 per cent. solution. The tablets of magnesium peroxid showed on analysis to correspond to 2.2 c.c. of the official 3 per cent. solution. One tablet in 183.5 c.c. of milk therefore corresponded to 0.36 parts H_2O_2 per thousand. The tablets were crushed before addition to the milk.

For water the amounts taken were one-eighth of the amount used for milk. That is to say, 0.045 parts H_2O_2 per thousand were added to one flask, 0.9 parts per thousand to the second, and 0.18 parts per thousand to the third. Expressed in teaspoonfuls: For the 3 per cent. solution, 1.5, 3 and 6 teaspoonfuls per gallon of water, for the 4.5 per cent. solution 1, 2 and 4 teaspoonfuls per gallon. Corresponding to these figures one tablet of magnesium peroxid in 1,467 c.c. water represents 0.045 parts H_2O_2 per thousand.

The amounts of H_2O_2 solution used were in accordance with the statements of manufacturers without regard to the accuracy of these statements.

The hydrogen peroxid solutions were allowed to act for six hours at room temperature, which averaged about 22 C. (71.6 F.). Plates were prepared from suitable dilutions and incubated for two days at 37 C. (98.6 F.). After twenty-four hours' action of the hydrogen peroxid another set of plates was prepared. Counts were always made after forty-eight hours.

The preparation, designated as Preparation 1 in the tables, was bought from various dealers. The other three preparations were obtained from the chemical laboratory of the American Medical Association. Preparation 1, therefore, had been subject to possible deterioration in the hands of dealers, while the other three preparations were obtained by the laboratory of the American Medical Association direct from the manufacturers.

The accompanying tables show the results of the investigation in condensed form. Preparations 1, 2 and 3 are solutions of H_2O_2 of various manufacture. Tablets of magnesium peroxid were designated Preparation 4. The number of flasks represent the various amounts of H_2O_2, supposed to be contained in the four preparations. Thus: For tap-water and bacterial suspensions in sterile water, Flask 1 received 0.045 parts H_2O_2 per thousand; Flask 2, 0.09 parts H_2O_2 per thousand, and Flask 3, 0.18 parts H_2O_2 per thousand. For milk and bacterial suspensions in sterile milk, Flask 1 received 0.36 parts H_2O_2 per thousand; Flask 2 received 0.72 parts H_2O_2 per thousand, and Flask 3 received 1.44 parts H_2O_2 per thousand.

Table 1 shows that if 99 per cent. or over of reduction is taken as sufficient efficiency, Flask 1 showed efficiency only in Experiment 3, Preparation 3; if the period of action is limited to six hours. Flask 2 showed efficiency in Experiments 1, 2 and 3 with Preparation 3. Flask 3 showed efficiency in Experiments 1 and 2 with Preparation 2 and in Experiments 1, 2 and 3 with Preparation 3. The magnesium peroxid tablets (Preparation 4) were not efficient in any case. After twenty-four hours the efficiency is somewhat greater. In Experiments 1 and 3, Preparation 3 was efficient in Flask 1; in Experiment 1, Preparation 2 was efficient in Flask 2, and in Experiments 1, 2 and 3, Preparation 3 was efficient in Flask 3. On the whole, this series shows that H_2O_2 solutions are efficient, after six hours, in amounts of 0.09 of actual H_2O_2. Preparation 4 is insufficient even after twenty-four hours in the quantities tested.

TABLE 1.—THE GERMICIDAL EFFICIENCY OF COMMERCIAL PREPARATIONS OF H_2O_2 ON TAP-WATER

Sample No.	Preparation	Flask	Efficiency	
			After 6 Hrs. Per Cent.	After 24 Hrs. Per Cent.
1	1	1	92.45	92.45
		2	93.66	94.56
		3	95.47	98.29
	2	1	97.73	98.34
		2	98.47	99.24
		3	99.39	99.55
	3	1	99.51	99.73
		2	99.51	99.76
		3	99.76	99.76
	4	1	81.11	86.24
		2	88.92	92.41
		3	98.71	90.08
2	1	1	96.21	96.60
		2	97.65	98.43
		3	98.17	99.48
	2	1	97.24	97.70
		2	98.39	98.62
		3	99.54	99.54
	3	1	98.69	97.94
		2	99.13	99.13
		3	100.00	100.00
	4	1	29.27	74.69
		2	97.99	77.25
		3	98.86	76.87
3	1	1	90.28	92.13
		2	94.45	98.61
		3	99.08	99.08
	2	1	95.47	97.22
		2	97.22	98.99
		3	98.74	99.50
	3	1	99.43	99.62
		2	99.81	99.81
		3	100.00	100.00
	4	1	40.18	81.47
		2	94.73	82.23
		3	98.71	85.63

Table 2 shows similar results, except that different organisms are sensitive to a different degree to the action of H_2O_2. Thus *Bacillus typhosus* seems somewhat more sensitive than *B. prodigiosus*, and *B. prodigiosus* somewhat more than *B. coli*. The differences, however, are slight and may come within the range of experimental error. In this series again 0.09 parts of H_2O_2 are sufficient, after six hours, if the preparation is fresh. After twenty-four hours 0.045 parts are sufficient. Preparation 4 shows more efficiency on bacterial suspensions than on tap-water.

Table 4 shows the effect of H_2O_2 on market-milk. Since milk contains a large amount of oxidizable material it is necessary to use larger amounts of H_2O_2. Probably the enzymes contained in market-milk are important

factors in decomposing H_2O_2. We find here that after six hours only Flask 3 showed sufficient bactericidal efficiency, although not uniformly so. After twenty-four hours the efficiency is greater. In Sample 2, Experiments 1 and 2, the numbers of bacteria in the milk examined were exceedingly small, so that the percentage of efficiency would naturally be somewhat lower than in milks with high bacterial counts. It is of particular interest in this and the following series, that the magnesium peroxid tablets showed no germicidal efficiency whatever. Magnesium peroxid is insoluble, and the evolution of H_2O_2 is probably so slow that enzymes and organic substances absorb the H_2O_2 before germicidal effect on bacteria can take place.

In Table 4 the results of action of H_2O_2 on bacterial suspensions in milk are shown. On the whole, the germicidal efficiency is somewhat greater than in raw milk; 0.36 parts H_2O_2 per thousand seem to be sufficient after six hours.

The tables show that Preparations 2 and 3 were slightly more efficient than Preparation 1. This may be accounted for by the fact, stated before, that Preparations 2 and 3 were obtained direct from the manufacturers, while Preparation 1 was purchased from dealers. This supposition is borne out by a series of experiments made with Preparation 1 after having been kept in the ice-chest. After six, seven and eleven days the germicidal efficiency was but slightly impaired, but after fourteen days there was considerable deterioration, after twenty-one days still more deterioration, and after thirty-five days the efficiency of 0.36 parts H_2O_2 per thousand after six hours was 29 per cent.; of 0.72 parts H_2O_2 67 per cent., and of 1.44 parts H_2O_2 81.5 per cent. After twenty-four hours' activity there was an increase of bacteria, showing that all H_2O_2 had been decomposed before the elapse of twenty-four hours.

There is, on the whole, more variation in the efficiency of Preparation 1 than in the efficiency of Preparations 2 and 3. This may, of course, also be due to the conditions under which Preparation 1 had been kept by dealers, so that partial deterioration had taken place previous to purchase for these experiments.

TABLE 2.—THE GERMICIDAL EFFICIENCY OF COMMERCIAL PREPARATIONS OF H_2O_2 ON SUSPENSIONS OF BACTERIA IN STERILE WATER (AVERAGE OF TWO EXPERIMENTS)

Organism	Preparation	Flask	Efficiency	
			After 6 Hrs. Per Cent.	After 24 Hrs. Per Cent.
B. typhosus	1	1	66.50	99.99
		2	86.52	100.00
		3	97.75	100.00
	2	1	99.67	99.78
		2	99.96	99.97
		3	99.97	100.00
	3	1	95.45	99.99
		2	99.94	99.98
		3	99.99	100.00
	4	1	99.32	99.98
		2	99.83	99.99
		3	99.99	100.00
B. coli	1	1	97.33	99.35
		2	97.80	99.47
		3	99.25	99.58
	2	1	99.91	99.88
		2	99.95	99.94
		3	99.97	99.96
	3	1	76.14	99.58
		2	97.35	100.00
		3	99.88	100.00
	4	1	96.21	99.99
		2	96.29	99.99
		3	95.95	99.99
B. prodigiosus	1	1	98.90	99.96
		2	99.43	99.97
		3	99.79	99.99
	2	1	99.45	99.94
		2	99.85	99.96
		3	99.86	100.00
	3	1	78.83	99.83
		2	98.03	99.99
		3	99.84	100.00
	4	1	99.28	99.69
		2	99.59	99.85
		3	99.78	99.99

TABLE 3.—THE GERMICIDAL EFFICIENCY OF COMMERCIAL PREPARATIONS OF H_2O_2 ON MARKET-MILK

Sample No.	Preparation	Flask	Efficiency	
			After 6 Hrs. Per Cent.	After 24 Hrs. Per Cent.
1	1	1	96.69	99.95
		2	99.84	99.97
		3	99.99	99.99
	2	1	96.98	99.95
		2	97.67	99.96
		3	99.58	99.99
	3	1	91.33	98.40
		2	96.63	99.78
		3	99.93	100.00
	4	1	6 fold inc.	Too many to count
		2	6 fold inc.	
		3	5.5 fold inc.	
2	1	1	73.42	44.62
		2	97.28	98.25
		3	97.48	98.82
	2	1	86.27	96.71
		2	88.24	98.03
		3	96.08	98.73
	3	1	97.04	99.92
		2	99.70	99.96
		3	99.92	99.96
	4	1	3.9 fold inc	Too many to count
		2	4 fold inc.	
		3	4 fold inc.	
3	1	1	99.92	41.64
		2	99.99	96.64
		3	100.00	100.00
	2	1	96.84	99.69
		2	97.81	99.73
		3	99.36	99.79
	3	1	89.30	86.76
		2	97.61	99.34
		3	99.97	99.99
	4	1	5.2 fold inc.	Too many to count
		2	5 fold inc.	
		3	5.4 fold inc.	

SUMMARY

Hydrogen peroxid has considerable value as a germicide for two reasons: First, the enormous reduction of numbers of bacteria, and second, the harmlessness of the decomposition products. Suspensions of *B. typhosus*, *B. coli* and *B. prodigiosus* are very sensitive to the action of H_2O_2 in quantities corresponding to 3, 6 and 12 teaspoonfuls of a 3 per cent. solution of H_2O_2, and to 2, 4 and 8 teaspoonfuls of a 4.5 per cent. solution of H_2O_2 per quart of milk. Suspensions of the same bacteria in sterile water are sensitive to the action of H_2O_2 solutions in quantities corresponding to 3 and 6 teaspoonfuls of a 3 per cent. solution of H_2O_2, and to 2 and 4 teaspoonfuls of a 4.5 per cent. solution of H_2O_2 per gallon of water; these results are accomplished in six hours. Complete destruction is accomplished rarely, however, and cannot be depended on.

In drinking-water an amount of H_2O_2 corresponding to 3 teaspoonfuls of a 3 per cent. solution and to 2 teaspoonfuls of a 4.5 per cent. solution per gallon are

sufficient to destroy 99 per cent. or more of all bacteria in six hours. In market-milk an amount of H_2O_2 corresponding to 6 teaspoonfuls of a 3 per cent. solution and to 4 teaspoonfuls of a 4.5 per cent solution per quart are sufficient to destroy 99 per cent. or more bacteria. The preparations must be fresh, however, in order to accomplish these results. In milk as in water, complete sterility is rarely accomplished by the quantities mentioned, and would require relatively large amounts.

Commercial preparations of hydrogen peroxid are often not uniform in composition. This depends on the age of the preparation, the temperature at which the preparation has been kept, and on the presence of foreign substances, such as acids, acetanilid, barium salts, etc. It is not safe, therefore, to depend on the germicidal activity of commercial solutions, unless the composition

TABLE 4.—THE GERMICIDAL EFFICIENCY OF COMMERCIAL PREPARATIONS OF H_2O_2 ON SUSPENSIONS OF BACTERIA IN STERILE MILK (AVERAGE OF TWO EXPERIMENTS)

Organism	Preparation	Flask	Efficiency	
			After 6 Hrs. Per Cent.	After 24 Hrs. Per Cent.
B. typhosus	1	1	99.88	99.97
		2	99.93	99.98
		3	99.99	99.99
	2	1	99.95	99.98
		2	99.97	100.00
		3	99.99	100.00
	3	1	99.95	99.98
		2	99.98	99.99
		3	100.00	100.00
	4	1	1.7 fold inc.	1.1 fold inc.
		2	1.6 fold inc.	3.8 effic.
		3	1.4 fold inc.	15 effic.
B. coli	1	1	99.18	99.39
		2	99.89	99.78
		3	99.95	99.90
	2	1	99.88	99.86
		2	99.96	99.96
		3	99.98	99.98
	3	1	99.77	99.81
		2	99.93	99.99
		3	99.99	100.00
	4	1	4.4 fold inc.	Too many to count
		2	4.5 fold inc.	
		3	4.2 fold inc.	
B. prodigiosus	1	1	99.16	99.26
		2	99.25	99.49
		3	99.33	99.77
	2	1	95.97	99.68
		2	99.42	99.93
		3	99.81	100.00
	3	1	99.94	99.99
		2	99.99	99.99
		3	100.00	100.00
	4	1	3.2 fold inc.	Too many to count
		2	2.8 fold inc.	
		3	3.1 fold inc.	

at the time of use is known. Magnesium peroxid tablets, although probably more stable than solutions of H_2O_2, are not soluble and must be pulverized before adding to the substance to be treated. Even then, the evolution of H_2O_2 seems to be gradual and irregular, so that germicidal activity cannot be depended on. The temperature at which action is to take place must be high enough to insure germicidal activity. Ordinary room temperature is favorable, higher temperature up to 52 C. (125.6 F.) is to be preferred, but milk and water must be cooled after the close of the period of action in order to render them palatable and to prevent multiplication of the bacteria remaining.

For practical application in rendering water and milk safe, hydrogen peroxid solutions can at best be considered only emergency measures. Expense, uncertainty of composition and its possible influence on organic constituents and enzymes are complicating factors. The use of hydrogen peroxid solutions can be recommended only if pure solutions are available, but this procedure can never take the place of efficient water filtration or efficient pasteurization of milk.

A METHOD OF PERFORMING EXTERNAL URETHROTOMY IN IMPASSABLE STRICTURE *

A. B. CECIL, M.D.

BALTIMORE

The difficulties which have surrounded external urethrotomy have been only partially overcome by the later day operations. Young's method is by far the most practical procedure yet devised. In this operation the urethra is opened in the prostatic portion posterior to the stricture. At this point the urethra is easily located, as it is here dilated. Young's own description is quoted:

> The vertex of the prostate was then exposed as in the operation for perineal prostatectomy, after carefully dividing the central tendon and recto-urethralis muscle. By means of blunt dissection the membranous urethra and the anterior third of the prostate were exposed, the wound being held open by posterior and lateral retractors. A median incision was then made into the membranous urethra and the anterior portion of the prostatic urethra. It was found best to carry the incision back into the posterior urethra, because without a guide in the membranous urethra it was found somewhat difficult to find the lumen. In the prostatic urethra, the walls being more rigid, it is much less difficult to find the urethral lumen. The edges of the urethral mucous membrane were then picked up with artery forceps and a fairly large sound passed forward through the membranous urethra, and free communication between the two portions of the urethra, anterior and posterior to the stricture, was established. After the excision of the cicatricial tissue, the incision in the prostatic and membranous urethra was completely closed with three interrupted sutures of fine catgut on a large retained catheter, which emerged from the bulbous urethrotomy wound.

While external urethrotomy with a guide is a comparatively simple procedure, all surgeons of experience are agreed that external urethrotomy without a guide may in some cases be an extremely formidable operation. Few surgeons who have dealt extensively with this type of case have not been forced, after fruitlessly searching for the urethral canal, to resort to a suprapubic retrograde catheterization. While Young's procedure would obviate the necessity of a suprapubic operation, it may not always be possible to follow exactly the thread-like, tortuous urethral canal through its bed of scar tissue. It was on account of this difficulty that the following method was devised and recently used in a small series of cases in the Genito-Urinary Clinic of the Johns Hopkins Hospital.

METHOD

It has been demonstrated that a solution of methylene blue when injected into the urethra will permeate and stain the canal in such a manner that it can be followed throughout its entire course. A solution of 1 gm. medicinal methylene blue to 200 c.c. of distilled water is in general the proper dilution. Stronger solutions tend

*From the Genito-Urinary Clinic of Johns Hopkins Hospital.

to cloud the field of operation when the urethra is incised, and weaker solutions do not sufficiently stain the urethral mucous membrane. The stain is injected with an ordinary urethral syringe previous to operation. The method of injection requires some attention, on account of certain anatomic peculiarities found in strictures. Not only is there a pouch or dilatation behind, but occasionally there is one also in front; this is due to the shoving forward of the strictured portion of the urethra by the pressure of urine from behind. Aside from this, the urethra is often distorted, so that there may be a pouch on one side of the anterior opening of the strictured urethra. In other words, the opening of the stricture is often anterior to a pouch, or placed higher up in the canal.

The injection should at first be made with little force, for should the fluid suddenly be forced in under pressure, it might dilate a pouch sufficiently to obstruct the canal and thus prevent the passage of the staining solution through the strictured urethra. After the injection has been made with moderate pressure, more force should be used. In all cases the penis should be elevated to facilitate the injection.

The urethra having been injected and the stain allowed to remain in for about five minutes, it should be washed out with sterile water. A sound is then passed through the anterior meatus as far as possible and an incision made directly down on it in the midline of the perineum. The urethra is then laid open and retracted by means of silk sutures. The further course of the canal is easily seen as a dark-blue passage. A grooved director may then be passed along the course of the canal as indicated by the blue stain, and the incision continued along it, but it is often easier simply to follow the canal with a pair of scissors. The staining makes it easy to see false passages branching out from the true canal. On account of the subsequent dilatation which must be carried out after the operation in any form of stricture, it is believed that it is well to close the false passages by removing the mucous membrane and uniting the tissues about them. Having laid out the course of the urethra, the scar tissue on each side is excised and the urethra thus rendered mobile. In a good many cases it will be found that the tortuous urethra, when freed and brought into the midline, will easily cover a large sound. This is due to the true shortening of the canal. A catheter is then passed into the bladder through the penis and the mucous membrane sutured about it. A small drain is next passed down to the urethra and the external wound closed with a few sutures.

In dealing with cases of obliteration of the urethral canal, where one or more fistulas are present, it has been my custom to inject the anterior urethra and the fistulas. A sound is then passed and incised on, the stain rendering it easy to trace the anterior urethra as far as the point of obliteration. Similarly by following the fistulous tract (stained blue by the injection), the urethra posterior to the stricture can be found and followed anteriorly to the point of obliteration. The intervening scar tissue may be excised with the assurance that there is no intervening canal, and the two ends of the urethra be then connected.

REPORTS OF CASES

The following cases are briefly reported to illustrate the above method:

CASE 1.—R. M. (Surgical No. 30,155), was admitted June 27 1912, complaining of stricture. He contracted gonorrhea in 1880. A few years later he noticed difficulty in urinating. In 1896 he was operated on for stricture with complete relief until 1907, when he again commenced to have difficulty in voiding urine. In 1910, he had complete retention, which was relieved by the passage of sounds. Since then difficulty in urinating and marked frequency have been evident. One week before admission a swelling appeared in the perineum. This became tender, extremely painful and in a few days ruptured. Since then, urine has been passed through the perineum.

Examination.—Well-nourished man. Perineal fistula with marked induration about it. One stricture (which allowed a filiform to pass), about 3 cm. from the meatus, another impassable one at about the bulbomembranous junction.

Operation.—External urethrotomy was performed by Dr. Geraghty, July 10, 1912. Repeated attempts to pass a filiform under anesthetic were unsuccessful. A solution of methylene blue was injected into the perineal fistula and the urethra was injected by way of the meatus. A grooved director was then passed through the fistulous opening and the tissues excised about it down to the urethra. At first sight it was impossible to make out any extension of the urethra posteriorly, but on opening it anteriorly, a small, darkly stained passage was seen, leading backward and to the left. This was laid open and followed, only to end blindly. Closer inspection along the exposed mucous membrane showed another stained passage, leading externally to the one which had been followed. This was laid open and found to be the true urethra. Instruments were then passed anteriorly in the pendulous urethra from behind, until the stricture there was dilated. A catheter was inserted in the whole length of the canal and the urethra sutured about it. A small perineal drain was then inserted. The patient made an uneventful recovery.

This case is of interest in showing the great benefit to be derived from staining the strictured urethra. In the first place, it was impossible to pass any sort of a guide. Further, it is believed that without the stain one of the false passages would almost surely have been made to connect with the bladder.

CASE 2.—M. C. (Surgical No. 31,039), was admitted Dec. 5, 1912, complaining of stricture. He had contracted gonorrhea thirty-nine and again thirty-two years previously. His present illness which began with difficulty in voiding urine was of about twenty years' duration. About eighteen years ago he had complete retention and was catheterized with great difficulty. Since then, at varying intervals, he had passed sounds on himself. He had marked frequency of urination.

Examination.—Well-nourished man, with impassable stricture in the bulbomembranous portion of the urethra.

Operation.—External urethrotomy was performed by Dr. Young, Dec. 5, 1912. Under an anesthetic, attempts to pass any kind of an instrument were unsuccessful. The urethra was injected with an aqueous solution of methylene blue, the patient put in the lithotomy position and a sound passed to the membranous urethra. An incision was then made in the midline of the perineum to the tip of the sound. On examination of the exposed urethra, a minute opening was seen, leading posteriorly through a dense bed of scar tissue. The urethra was stained deep blue, so that it could be easily followed with a knife and the bladder entered. A catheter was then passed through the meatus, and the urethra closed about it with chromic-gut sutures. The perineal wound was closed with chromic gut and a small drain inserted.

This case is of interest in showing how easily the very minute urethral opening could be followed without the aid of a guide.

CASE 3.—A. S. (Surgical No. 31,186), was admitted Dec. 25, 1912, complaining of stricture. He had contracted gonorrhea twenty-six years previously. Five years later he noticed difficulty in urinating. Three years before admission he had complete retention and had to be catheterized. During the past year, he had not had complete retention, although urination had been extremely difficult. For twelve years urine had been cloudy. On admission the patient constantly dribbled and

every ten or fifteen minutes after severe straining, would pass a few cubic centimeters of cloudy urine.

Examination.—This showed a poorly-nourished man. Rectal examination evidenced no outspoken enlargement of the prostate. Attempts to pass a catheter were unsuccessful. The catheter first met obstruction about 4 cm. from the meatus, but this could be passed and complete obstruction was encountered at the bulbomembranous portion of the urethra. Attempts were made to pass a filiform, but unsuccessfully. Following instrumentation, the temperature rose to 104, and patient had a severe chill. On the following day, another attempt was made to pass a filiform, but with no better result.

Operation.—External urethrotomy, Dec. 27, 1912. Under an anesthetic an unsuccessful attempt was made to pass a filiform. The urethra was then injected with a solution of methylene blue, the patient placed in the lithotomy position, and a sound passed to the bulbomembranous portion of the urethra. A midline incision was then made in the perineum just back of the bulb and the tip of the sound incised on. The urethra was found to be stained but when the attempt was made to trace it, it was found that the sound was in a false passage, to the right of the true passage, which was easily located, leading off from the urethra about 1 cm. above the tip of the sound. The minute blue-stained urethra then led through a dense mass of scar tissue, which was laid open and a gush of blue-stained urine showed that the stricture had been incised. The stricture in the pendulous portion of the urethra was then dilated with a sound, the scar tissue about the urethra excised and a catheter passed through the meatus. The urethra was sutured about this and a small drain inserted. This patient made an uneventful recovery.

This case is instructive. One might easily be misled in incising in the midline of the perineum directly from the tip of a sound; in this case the small strictured urethra would certainly have been missed.

The advantages of staining the urethra in impassable stricture may be summed up as follows: It allows one to follow the canal into the bladder. It utilizes the mucosa of the urethral canal. It allows the recognition of false passages, and renders, in many instances, what may be a most difficult operation a comparatively simple one.

ACUTE RHEUMATIC ORCHITIS

REPORT OF A CASE ASSOCIATED WITH ERYTHEMA NODOSUM AND ACUTE TORTICOLLIS IN A CHILD AGED TWO AND ONE-HALF YEARS

MURRAY H. BASS, M.D.

Attending Pediatrist to Mount Sinai Hospital Dispensary; Adjunct Attending Physician to the Sanatorium for Hebrew Children at Rockaway Park

NEW YORK

Acute so-called metastatic orchitis is more or less uncommon at any age, but in infancy or early childhood is of extreme rarity. The case described below in which such an inflammation of the testis occurred in a child aged 2½ years is therefore sufficiently unusual to warrant a detailed report.

Patient.—Harry G., 2½ years old, of Russian parentage, was brought to Mount Sinai Hospital dispensary on Jan. 4, 1913. He is the older of two children. Parents are healthy; there is no history of tuberculosis in the family.

Past History.—Breast-fed eleven months. At 20 months, measles complicated by pneumonia. Good recovery. At age of 2 years, acute swelling below the left ear, accompanied by malaise and fever; diagnosticated by a physician as mumps. Good recovery and no sequelae. Three weeks ago acute pustular eczema on the buttocks; lesions rapidly healing.

Present Illness.—This began one week before admission with malaise and fever. The child was cross and fretful and refused to eat; vomited twice. Bowels were regular; there was no cough. The day before admission the mother noticed that the child's neck was stiff and that he cried whenever she picked him up.

Physical Examination.—Well-developed child. Face flushed and eyelids somewhat puffy. Very irritable; screams when an attempt is made to hold him. Head held rigidly with the face turned toward the left shoulder; attempts at rotation evidently attended with much pain. Cervical lymph-nodes palpable as pea-sized nodules on both sides of the neck. Other superficial lymph-nodes not enlarged.

Skin: Over the buttocks and the upper part of the thighs there is an eruption of papular eczema, most of the lesions of which are in the process of healing. On the left leg over the shin there is an eruption consisting of several indurated nodules each about the size of a dime. The skin over these is bluish-red in color and distinctly hot.

Throat: Deeply congested, but shows no enlargement of the tonsils nor any exudate.

Teeth and gums: Negative.

Heart, lungs and abdominal viscera: Apparently normal.

Temperature: 102.5 F.

Urine: Except for a very faint trace of albumin, negative.

Diagnosis.—Acute pharyngitis, left-sided rheumatic torticollis, erythema nodosum. Old pustular eczema.

Treatment.—Two grains of aspirin four times a day was ordered and methyl salicylate was applied over the left leg.

January 7: Child appears improved. Temperature 100. Torticollis has disappeared. Pharynx less congested. A new crop of erythema nodosum has appeared over the right shin. Treatment to be continued.

January 9: The mother states that a day ago the child began to complain of pain about the genitals and that since twelve hours the scrotum has become swollen. No history of trauma. Examination shows the scrotum enlarged to twice its normal size. Marked local heat. Skin of scrotum edematous and dusky in color. Left testicle is felt enlarged to about the size of a hickory-nut; exquisitely tender. Right testis normal. Apparently no hydrocele is present. No urethral discharge. Temperature 100. Child looks sick. No evidence of torticollis. Parotid glands apparently perfectly normal. A few new efflorescences of erythema nodosum are present on both thighs. Salicylate treatment to be continued, and ice-bag to be applied to the scrotum.

January 10: General condition of child improved. Appetite returning. Temperature 99.4. The skin of the scrotum is less edematous and the testis can be distinctly felt. The body of the testis is especially involved; the epididymis to a less degree. A blood examination on this day gave the following result: Hemoglobin 85 per cent. Red blood-cells 4,568,000. White cells 11,000. Differential count; polynuclear neutrophils 57.5 per cent.; large lymphocytes 8.5 per cent.; small lymphocytes 33.5 per cent.; eosinophils 0.5 per cent. Urine: clear, acid, specific gravity 1.010. Very faint trace of albumin. Microscope shows an occasional pus cell; no casts.

January 11: Condition improving.

January 14 to 25: Child's condition good. The testicle gradually returning to normal size, the epididymis being the last portion to be involved. Temperature has remained normal.

January 25: Discharged cured.

February 18: Child well. No atrophy of testis. Von Pirquet test positive.

To sum up, then, we have here a child who in the course of an attack of erythema nodosum and a torticollis, develops a unilateral acute orchitis, which after two weeks goes on to complete recovery.

LITERATURE OF THE SUBJECT

Acute metastatic orchitis has been described as occurring in a number of diseases, among which may be mentioned mumps, variola, angina, influenza, pneumonia, typhoid, paratyphoid, malaria, scarlet fever, pyemia and rheumatism.

The orchitis of mumps is probably the variety most often seen, though in young children it is unusual. It

is most frequent in young adults and when it occurs in childhood is usually found in individuals approaching the age of puberty. The statistics given by Hutinel and Darré[1] are of interest in this connection: Barthez and Sanné noted in 230 cases of mumps ten cases of orchitis of which seven were in boys between the ages of 15 and 17. Rilliet, Henoch and Comby never observed a patient under 14 years of age. Steiner has seen a case in a nurseling whose parents were suffering from mumps; and two other patients, aged 4 and 9 years respectively, are reported by French physicians. The testicle may be the first and at times the only seat of the disease, the parotid not being involved, as in a case reported by Beardsley[2] in which the brother of a child ill with parotitis developed an acute orchitis. The orchitis of mumps usually lasts from eight to ten days and may be followed by atrophy of the testicle.

The connection between rheumatism and acute orchitis has long been noted, though reports of cases are very infrequently found. On this subject Roderick Macleod,[3] writing in 1842, says:

> I think I have several times seen rheumatism of the tunica albuginea testis. Persons subject to rheumatism have complained of acute pain coming on suddenly accompanied by increased heat and by great tenderness to the touch, but without tumefaction; the symptoms shifting from one testis to the other and at last disappearing as suddenly as they had come on—just in the manner we see rheumatism change from one joint to another.

Cheadle[4] fails to mention orchitis, and numerous text-books on genito-urinary diseases, both in English and in German, devote but little space to the subject. It is chiefly to French clinicians that we are indebted for drawing attention to this form of orchitis. Besnier[5] describes the condition in detail and numerous French theses have been written on the subject.[6] Testicular inflammation may precede or accompany an attack of acute articular rheumatism and the characteristics of the orchitis are the same as of that occurring in mumps. Usually it is a simple inflammation, bilateral or involving first one side then the other; its duration is usually not beyond that of the arthritic symptoms, but in rare cases it may go on to atrophy. Several of the cases described were complicated by hydrocele.

Closely related to this variety of orchitis is that seen as a complication of tonsillitis, of which cases are occasionally reported.[7] Teysseyre[8] has described a case in a man 26 years old, and has collected reports of nine other cases from the literature, all of them occurring in adults. Clinically this variety resembles rheumatic orchitis, being usually unilateral, coming on suddenly, lasting five to fourteen days and rarely going on to atrophy or suppuration. Hutinel and Nobécourt[1] comment on the rarity of this complication of sore throat in children, pointing out that here, as in the other types mentioned above, the testis seems much more vulnerable after it has taken on full functional activity.

Finally may be mentioned that a few cases of acute orchitis in children have been reported as a complication of influenza.[9]

The most logical diagnosis of the case above reported appears to be that the whole syndrome is a manifestation of rheumatism. The symptoms can certainly all be explained as the result of some acute infectious agent entering most probably by way of the pharyngeal mucosa or the tonsil, affecting the neck muscles and thus causing a torticollis, giving rise to toxic manifestations in the skin in the form of a nodular erythema and finally localizing in the testis and there producing a sudden acute orchitis. Since each of these four conditions—pharyngitis, torticollis, erythema nodosum and orchitis—has been described as a manifestation of acute rheumatism, it appears the correct diagnosis in this case in spite of the fact that the patient was but 2½ years of age. Rheumatism in early childhood is a very uncommon condition, but undoubted cases have been recorded even in infants under one year of age. It is well known that in children of any age the articular symptoms are the least prominent of the various rheumatic manifestations and this is particularly true of young children and infants. Two cases of torticollis, however, which lasted but a few days and cleared up on the administration of salicylates, have been reported by Wachenheim[10] in babies aged, respectively, 14 and 16 months, and arthritis, though acknowledged to be very rare, has been described as occurring even in early infancy. Thus Miller,[11] in 1899, collected reports of nineteen cases of acute articular rheumatism in infants under one year, while Schlossman,[12] in 1903, reported several others in very young children.

The classification of erythema nodosum as a rheumatic affection may be questioned by some, since many clinicians now believe that erythema nodosum should be looked upon as a separate clinical entity akin to the eruptive fevers, Abt.[13] But as the eruption has been described as occurring in the course of various infectious diseases as diphtheria, typhoid, streptococcemia, scarlet fever, rheumatic fever and tuberculosis, there is still considerable support for the theory that the eruption is merely a local manifestation of some general intoxication.

The fact that the child showed a positive reaction to the von Pirquet test is also of interest in view of the fact that a very close relation is supposed by some to exist between erythema nodosum and tuberculosis.[14] From the clinical course of this illness and the complete recovery, however, there does not seem to be any reason to suppose that tuberculosis infection was a factor in its etiology.

Testicular mumps may be excluded by the following: the patient's parotid glands were normal throughout the illness; the child was constantly with a brother, who at no time showed any symptoms of mumps, and finally there is a clear history of an attack of mumps in the patient seven months previous to the beginning of this illness.

54 West Ninety-First Street.

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VENEREAL PROPHYLAXIS: WHY IT SOMETIMES FAILS

R. A. BACHMANN, M.D.
Surgeon, U. S. Navy; U. S. S. "Delaware"
NEW YORK

Major F. F. Russell and Captain J. H. Nichols, Medical Corps, U. S. Army, recently undertook[1] to demonstrate the value of calomel ointment, alone and in combination with other antiseptics, as a prophylactic against gonorrhea. Their procedure consisted of injecting the ointment to be tested into the urethras of men suffering from acute gonorrhea after the discharges had been diagnosed as positive by stained smears and growths on ascites agar.

The ointment was allowed to remain in the urethra, after injection, about fifteen minutes, then the mucous membrane was washed clean by urination and a drop of the residue expressed into the meatus. This drop was streaked over ascites agar, incubated and suspicious-looking colonies examined with Gram's stain.

Their first experiments[2] were with the tube used in the army containing:

Calomel	25 parts
Phenol	3 parts
Camphor	3 parts
Lanolin	25 parts
Lard enough to make	100 parts

It proved effective in seven out of eight instances.

They next tried a 30 per cent. calomel in lanolin ointment, a 3 per cent. phenol in lanolin ointment and some more of the Army tubes, the latter being designated as the "new" Army tube. These various ointments proved to be failures in eight out of eight cases.

Prior to these experiments I had obtained nine exposures from different men to an infected woman. They all used a tube since then placed by the Navy Department in the canteens of the battleships of the Atlantic fleet. I also secured two accidental controls who did not use any protection. All of the former were negative, both of the latter were infected.

With these Navy tubes then I repeated Russell and Nichols' work, changing their technic, in the first sixteen cases, by using a platinum loop scraping after the urination, instead of expressing a drop of the urethral residue into the meatus. The sterilization was done at noon and the men saved their morning urine so that the urethra was thoroughly flushed out.

As it was desired that the total germicidal power of the ointment should be determined, not only gonococcus, but all colonies were considered and counted as failures for the tubes. The ointment in the Navy tube is practically 33⅓ per cent. calomel and 1 per cent. tricresol in benzoinated lard.[2] The results shown in Table 1 were obtained.

Then another series was tried, milking a drop of fluid into the meatus after urination as in the Army experiments. At first glance it appears that using the platinum loop would obtain material perhaps deeper from the folds of the urethra, etc., but when it is considered that all the contents of the glands of Littré and the lacunae contribute toward the drop of fluid that presents at the meatus when the penis is milked, this becomes doubtful. It must be borne in mind, too, that disinfecting an acute pufulent gonorrheal urethra and preventing the growth of gonococcus in a normal urethra are two widely different propositions, and the results from the former must be judged only relatively in considering their value in the latter.

After these two series six Army tubes were purchased in the open market. I could not find out if they were old or new, but a descriptive leaflet enclosed referred to the experiments of Russell and Nichols and it was concluded they were the same formula as the old. Their complete failure, however, left considerable doubt about this.

Table 3 shows the result in each case.

The experiments point out the great variability that may be encountered in preparations of almost the same ingredients and proportions intended for the same purpose. Now add to this the difference in the mechanical application of these ointments and it becomes apparent that not only must the results in actual use be diverse but also failures are bound to occur.

So far gonorrhea alone has been under consideration. On this side of the Atlantic Metchnikoff's discovery was accepted without question and calomel salve became the undisputed protection against syphilis. No matter whether the single or the double system was employed, Army or Navy, calomel salve was beyond the range of doubt. And perhaps justly so, although both Neisser and Gaucher attacked its claim and produced evidence to the contrary. But the curious phase of the calomel salve question is that though Metchnikoff's results were accepted and one would expect that his formula should

TABLE 1.—RESULTS WITH NAVY TUBES. CULTURE MADE BY CURETTING URETHRA

Before Treatment Name	Culture*	Remarks
1. S——e	—	
2. H——n	+	About same growth
3. C——e	—	
4. W——s	+	About same growth
5. M——r	+	More growth after treatment
6. H——n	—	
7. C——e	—	
8. R——n	+	Some decrease
9. S——t	—	
10. F——e	—	
11. M——r	—	
12. D——r	—	
13. H——n	+	
14. L——r	—	
15. B——n	+	Greatly reduced
16. O——n	+	More after treatment

* After treatment. In this and the following tables, all cases gave postive results before treatment.

TABLE 2.—RESULTS FROM NAVY TUBES. CULTURES MADE FROM FLUID EXPRESSED INTO MEATUS

Name	Culture	Remarks
1. H——n	—	
2. C——e	+	Less growth after treatment
3. C——e	+	Less growth after treatment
4. D——r	+	Less growth after treatment
5. H——a	+	Less growth after treatment
6. H——a	+	More growth after treatment
7. S——h	—	
8. H——n	—	
9. C——e	—	
10. H——a	+	One colony after treatment
11. C——e	—	
12. S——h	—	
13. S——e	+	Slight growth after treatment
14. C——e	+	Growth same
15. S——e	+	Less growth after treatment
16. E——e	—	

TABLE 3.—RESULTS WITH ARMY TUBE

Name	Culture	Remarks
1. H——n	+	No change
2. C——e	+	Less after treatment
3. S——e	+	No change
4. H——n	+	No change
5. C——e	+	No change
6. J——y	+	Greater growth after treatment

1. Russell, F. F., and Nichols, J. H.: Mil. Surg., August, 1912.
2. Since then the percentage of tricresol has been raised to 2%, to allow wider margin of safety, all experiments, however, were made with the preceding formula.

be used, scarcely anybody paid the slightest attention to it; the Army and Navy is full of calomel salves but of Metchnikoff's salve there exists hardly a report.

Even Neisser, in his series of four failures, employed a 10 per cent. ointment though Metchnikoff has always insisted on 33⅓ per cent. A slight change of 1 or 2 per cent. may not have series consequences, but the larger variations certainly appear indefensible. Moreover, he lays great stress on the exact fatty composition of his ointment base. As far as I know the exact formula for this has never been published and therefore some excuse exists for finding a 100 per cent. lanolin base used in one ship or barracks and a 100 per cent. petrolatum base in another, which has been my experience.

A safe effective limit of one hour was fixed at the Pasteur Institute and there is not much to say for the advisability of applying calomel ointment after a period longer than that. There is certainly no evidence at hand to show that it is valuable after six hours. The method used in the Army and Navy whereby a man is anointed on returning, from eight to twenty-fours hours or even later, to his barracks or post, has never diminished the admission rate of syphilis in either service since its adoption and should be classed as a failure.

It is hoped that the foregoing will not be considered as a condemnation of venereal prophylaxis. On the contrary, it is simply meant to put the subject on a sounder basis and thus shield an infant work from undeserved criticism that might otherwise stop its growth and development.

A study of the tables shows the danger of trusting, without question, any preparation that professes prophylactic properties without giving proper assurance that its composition conforms to the few facts which so far have been ascertained about the subject.

But it is also shown in the experiments adduced that venereal prophylaxis, as far as the bacteriochemical end of it is concerned, is possible. The practical end of it, that is, the educational, psychological, moral and legal, has progressed also, but not quite at the same rate of speed.

TRANSMISSION EXPERIMENTS WITH THE VIRUS OF POLIOMYELITIS

FINDING THE VIRUS IN THE NASAL SECRETION OF A HUMAN CARRIER FOUR MONTHS AFTER THE ACUTE STAGE OF A SECOND ATTACK OF POLIOMYELITIS*

WILLIAM P. LUCAS, M.D.
AND
ROBERT B. OSGOOD, M.D.
BOSTON

Since our note on the finding of the virus of anterior poliomyelitis in the tonsils of recovered monkeys,[1] we have been carrying on similar experimentations with human tonsillar and nasopharyngeal tissues as we have been able to obtain them from time to time. Our results in this we presented to the Boston Society of Medical Sciences late in 1911. Our conclusions were that the results of these experimental studies with the filtrates of human nasopharyngeal tissues, removed at varying periods after the acute attack, may be said to be suggestive but not conclusive for the following reasons:

In three monkeys injected with three different tonsillar extracts no clinical signs of poliomyelitis followed the inoculations. In two monkeys the clinical signs were typical, but we were unable to pass the infection on to a second series of monkeys in a perfectly conclusive manner; nor were the pathologic findings absolutely typical, though suggestive, although they were much the same findings as those described by Klung, Pettersson and Wernstedt[2] in their investigations as to the duration of the virus in the human body.

We felt convinced that the nasopharyngeal tissue of recovered human patients was able to retain the virus for at least six months; but owing to the far-reaching importance of such a fact, we withheld the data from print. Since then, however, these facts have been proved conclusively by Klung, Pettersson and Wernstedt, and by Flexner. Further, not only have these investigations proved the presence of the virus in the washings from the nasopharynx of patients in the acute stage of the disease; but also, which is still more significant, the virus has been found in washings from the nasopharynx of parents, attendants and friends; and, further, Klung, Pettersson and Wernstedt have found the virus present in nasopharyngeal swabbings and washings as late as 204 days (seven months) after the infection.

The case we wish to report falls into this latter class of carriers, but the probable duration of the carrier was two years and three months.

R. H. (patient of H. G. Rockwell, Amherst, Mass.), aged 5, had his attack of paralysis in February, 1910. He was first seen by one of us (R. B. O.) Feb. 19, 1912. At that time he showed a residual paralysis of the dorsal flexors of both feet and of the peroneal group on the right. He improved till September, 1912; when, after an attack of apparent bronchitis and coryza, he became suddenly weak in the right arm, with increased weakness of the affected legs as well. This was associated with fever, and the mother considered it to be a second attack of paralysis. The boy gradually recovered. Within two weeks after this apparent exacerbation, his little sister had high fever, and one of her arms became completely paralyzed, with weakness of the legs. When the boy was seen on Nov. 8, 1912, six weeks after his recovery from the second attack, he was almost back in muscular strength to where he had been before, without any remaining paralysis of his arm. He still had a certain excess of nasal secretion. Through the efforts of his parents we were able to obtain 10 c.c. of clear mucoid nasal secretion on November 11. With this material passed through a Berkefeld filter, we inoculated two monkeys on November 15, with negative results. Again on Jan. 3, 1913, we received some nasal secretion and inoculated two monkeys with negative results.

We repeated this again, on January 22, injecting 10 c.c. of the filtrate intracerebrally into Monkey 157. This monkey became paralyzed February 2 and died February 5. He developed complete paralysis of all four extremities. The pathologic picture of his cord (Dr. H. C. Low) was not typical but very suggestive.

January 31 we again repeated the injection of filtrate from a fresh specimen of nasal secretion, inoculating two monkeys, Nos. 159 and 160. Monkey 159 received 5 c.c. of the filtrate intracerebrally and 10 c.c. intraperitoneally. He became paralyzed February 5 and died, completely paralyzed, February 8. Cord and medulla pathologically (Dr. H. C. Low) were typical of anterior poliomyelitis (see appended report); and April 9 we injected two monkeys, one with the cord emulsion of Monkey 157, and the second with the cord of Monkey 159. This last monkey, No. 161, received 8 c.c. of a cord emulsion from Monkey 159. He became paralyzed April 26, and died

* From the Laboratory of Surgical Research, Harvard Medical School. Experiments carried out by means of a grant from the Massachusetts State Board of Health.

1. Osgood and Lucas: Transmission Experiments with the Virus of Poliomyelitis, THE JOURNAL A. M. A., Feb. 18, 1911, p. 495.

2. Klung, Pettersson and Wernstedt: Investigations on Infantile Paralysis, Report from the State Medical Institute of Sweden to the Fifteenth International Congress on Hygiene and Demography, Washington, 1912.

April 27, with typical complete paralysis. The pathologic findings (see appended report, Dr. H. C. Low) were typical of anterior poliomyelitis. This case seems to us of special interest; first, as demonstrating the long period during which the virus was undoubtedly harbored in the nasopharynx; secondly, a human infection (his sister) occurring two years after his primary attack during what seemed like an exacerbation of his former attack; and, thirdly, the recovery of the virus from his nasal secretions four months after his second attack and two years and three months after his first attack; fourthly, the fact that the successful inoculations were done with filtrates from straight nasal secretions, not from washings.

PATHOLOGIC REPORT BY DR. H. C. LOW

Monkey 159.—Sections of the cord in the lumbar and cervical regions show moderate injection of the blood-vessels and some small round-cell infiltration about them. Changes are not marked but are consistent with the diagnosis of poliomyelitis.

Monkey 161.—Sections of the lumbar, dorsal and cervical regions show marked round-cell infiltration about the blood-vessels and in the perivascular spaces, more evident near the central canal and the anterior horns. Changes are typical of poliomyelitis.

374 Marlborough Street—372 Marlborough Street.

THE MODE OF TRANSMISSION OF POLIOMYELITIS

M. J. ROSENAU, M.D.

Department of Preventive Medicine and Hygiene, Harvard University Medical School.

BOSTON

From a practical point of view the mode of transmission is the most useful single factor in combating a disease. The health officer would prefer to know the precise mode or modes of transmission of any disease rather than its cause, or pathologic anatomy, or even its treatment. Hence a large amount of work has been done to determine how the virus of poliomyelitis leaves the body, how it enters its victim, and the route it takes from one person to the next. Despite all the thought and work that has been focused on this problem, the mode of transmission of poliomyelitis remains an open chapter, and although much light has been thrown on the subject, the present state of our knowledge does not permit of dogmatic, much less final statements.

There are two avenues of approach to a problem of this sort; one, through epidemiologic field studies, and the other through laboratory research work. Both these trails have been blazed. Much of the epidemiologic work has given conflicting results, and much of the laboratory work has likewise been confusing. The evidence obtained from the field and that from the laboratory, however, do not have an equal standing before the court. The fallibility of epidemiologic evidence has long been recognized. Sanitarians who have had a long experience know full well that it has always been necessary to revise the chapter on the epidemiology of a disease as soon as its mode of transference is discovered. All those who have collected field data are fully aware of the pitfalls. Errors are unavoidable from the very nature of the circumstances; the personal equation and also the limitations of the investigator often warp or dwarf the important facts. In any event, the enormous mass of data collected by careful investigators in the field is perplexing and difficult to analyze. Even if the epidemiologist has the detective instinct of a Sherlock Holmes, and the statistical genius of a Karl Pearson, he may be wholly carried off the track by the missed cases, and by the carriers, or by an incomplete knowledge of unusual forms of the disease, or by unknown factors in its etiology. On the other hand, the exact observations from the laboratory often throw a flood of light on our field work, and when the two are correlated we have real and useful additions to our knowledge.

There are many theories to account for the spread of poliomyelitis. The chief ones may be summarized under four headings: (1) that it is a "contagious" disease, communicated directly from person to person through the secretions from the mouth and nose; (2) that it is an insect-borne disease; (3) that it is conveyed through dust; (4) that it is an alimentary infection, the virus being taken in with food and drink and absorbed from the digestive tube. There is evidence from the field and from the laboratory to support each one of these theories. These four theories, however, do not include all the views brought forward to explain the mode of transmission of infantile paralysis. For example, the hypothesis has been expressed that the disease is transmitted to man from lower animals, particularly domesticated animals, but there has been no convincing demonstration that the infection occurs naturally in any other animal than man.

In view of the uncertainty concerning the mode of transmission of poliomyelitis it is worth while to take stock of our knowledge of this subject. I have therefore briefly summarized the evidence pro and con.

That anterior poliomyelitis may be a contagious disease was first announced by Wickman of Sweden, whose epidemiologic investigations upon the subject are now classic. Wickman formulated a new symptomatology; his greatest contribution to the subject was perhaps the discovery that abortive cases of the disease occur. These mild, and hitherto unrecognized clinical forms, shed an entirely different light on the epidemiology. Wickman brought forward strong evidence in support of the view that the disease was transmitted directly from person to person, especially through the abortive or missed cases, as well as through suspected carriers.

The theory that infantile paralysis is a "contagious" disease was the first, and is the most natural explanation to account for its spread. In many respects infantile paralysis resembles epidemic cerebrospinal meningitis, with which disease it is, in fact, sometimes confused. Flexner has emphasized the resemblance between the two infections, and has been an able and valiant champion of the view that the virus in both these diseases leaves the body in the secretions from the mouth and nose and enters the victim through the same channel. Corroboration of this view has come especially through the work of the Swedish investigators, Kling, Pettersson and Wernstedt, who claim to have demonstrated the virus in the secretions from the nose and throat, not only in cases during the acute stage, but also during various stages of convalescence, and even in healthy carriers. Furthermore, Osgood and Lucas demonstrated the virus in the mucous membrane of a monkey five and a half months after recovery from the experimental disease and recently they recovered it from a chronic carrier in man. Kling claims to have found the virus in the nasopharynx up to seven months in a few human cases. Finally, it is possible to infect monkeys simply by placing the virus on the uninjured mucous membrane of the nose and throat. The evidence, therefore, that we are dealing with an infection that leaves the body in the secretions from the nose and throat, and enters by the same channel, is strong, both from

epidemiologic studies and from laboratory investigations. That this evidence, however, is not conclusive, may be gleaned by a little closer consideration of the facts.

It is important, first of all, to remember that we have no clear-cut criterion by which to judge what is and what is not anterior poliomyelitis. When the symptoms are characteristic and the lesions typical we are justified in making a definite diagnosis. In any critical case, however, further corroboration must be had by transferring the virus from monkey to monkey in order to demonstrate that we are, in fact, dealing with a communicable infection capable of reproducing itself. When we apply this criterion to some of the work that has been reported, to support the view that infantile paralysis is a "contagious" disease, we find the evidence not as strong as the conclusions of the experimenters would lead us to suspect. The mere fact that an animal has an acute paralytic affection, associated with perivascular infiltrations, degeneration of the neurons, and occasional hemorrhages into the cord, is not enough, in the present state of our knowledge, to justify us in labeling it poliomyelitis. The criterion in critical cases must be the power of the virus to reproduce itself and repeat the symptoms and lesions of the infection through succeeding generations.

There has been a long series of negative results in attempts to demonstrate the presence of the virus in the secretions from the mouth and nose. Strauss, Rosenau, Sheppard and Amoss, Flexner, and also Anderson and others, have all reported failures in this regard. These negative results have a certain degree of positive significance, for if the usual means of transmission of the disease is through the secretions from the mouth and nose we should not have such great difficulty in demonstrating its presence in these secretions. Only Kling,[1] Pettersson and Wernstedt have found it comparatively easy to make this demonstration. These investigators believe that they have established the important fact that carriers occur, and are several times more numerous than the frank and abortive cases of poliomyelitis combined. Yet Flexner, Clark and Frazer report only one positive result out of numerous trials. They succeeded in demonstrating the virus of poliomyelitis in the washings from the nasopharynges of the parents of a child suffering with poliomyelitis. The parents, however, showed no symptoms of illness.

The virus of anterior poliomyelitis is widely diffused throughout the body. It has been found in greatest virulence and concentration in the spinal cord of infected persons and animals. The virus is also quite constantly present in the brain and other organs and tissues as, for instance, the mucous membrane of the nose and pharynx, the mesenteric glands, the axillary and inguinal lymph-nodes, and even in the blood and the cerebrospinal fluid. Recently the virus has been demonstrated in the mucosa of the intestinal tract, and finally in the feces. It is therefore no surprise that a virus with such a wide distribution and so generally diffused throughout the body may occasionally be found in the secretions from the nose and throat. These facts make us hesitate to conclude that infantile paralysis must be a contagious disease, simply because it has been demonstrated experimentally that the virus may be found occasionally in the secretions from the nose and throat; it would be just as logical to conclude that the disease in its spread resembles typhoid fever because the virus has been demonstrated in the mucous membrane of the digestive tube and has also been found in discharges from the intestines.

There are other difficulties which must be met before we can accept as a proved fact that infantile paralysis is a contagious disease. Careful and masterly epidemiologic investigations of poliomyelitis have been conducted by the Massachusetts State Board of Health extending over a period of five years. The results of these studies were summarized by Dr. Mark W. Richardson, who plainly brought out the fact that the disease, as observed in Massachusetts, does not have the earmarks of a contagious disease. The disease prevails in rural rather than under urban conditions. In fact it shows little tendency to invade cities, and when it does enter the city, it does not strike the crowded, congested portions of the city. In all other contagious diseases spread through the secretions from the mouth and nose, epidemic outbreaks have been observed in crowded sections of cities, in asylums, hospitals, jails, on shipboard, and similar places where the spread of infection by contact is favored. This is the case with scarlet fever, diphtheria, measles, mumps, whooping-cough, influenza, common colds, pneumonia, and finally cerebrospinal meningitis. Cases of infantile paralysis in all stages of the disease have been taken into the hospitals, orphan asylums, children's homes, reformatory schools, and other institutions in the Commonwealth, but in no instance during the five years in which the disease has been studied has it ever spread under these circumstances.

The seasonal prevalence, furthermore, of infantile paralysis does not suggest the seasonal prevalence of the diseases spread by contact through secretions from the mouth and nose. Almost all such diseases, including cerebrospinal meningitis, occur more particularly during the cold months of the year, whereas the prevalence of infantile paralysis is more marked during the summer months.

The curve of seasonal prevalence of infantile paralysis corresponds more closely with that of typhoid and the diarrheal diseases than it does with the group of infections spread through the secretions from the mouth and nose. Typhoid has its season of maximum prevalence during the warm weather. Water-borne epidemics are apt to occur in the colder months of the year, and milk outbreaks may take place at any time. "Normal," or residual typhoid is a warm weather disease and corresponds in this regard with cholera, dysentery, and the infantile diarrheas, and other intestinal infections. The only other group of diseases which prevail especially during the warm weather, are those which are insect-borne. Yellow fever stops with the first frost. The most pernicious form of malaria (estivo-autumnal) extends into the autumn, but the autumn of tropical regions is warm, rainy and favorable to mosquito life. The season of maximum prevalence of the insect-borne diseases corresponds, of course, to the season of maximum prevalence of insect life, namely, the summer.

It has long been evident to the student of epidemiology that the group of "contagious" diseases spread through the secretions from the mouth and nose occur throughout the entire year, but prevail especially during the

1. Kling found it comparatively easy to demonstrate the presence of the virus in the washings from the mucous membranes. Thus he found that 78 per cent. of the monkeys contracted the disease after inoculation with water in which the mucous membranes of poliomyelitis cadavers had been rinsed. The virus was also found almost constantly in the secretions from the nose and throat of acute poliomyelitis patients. These results are so much at variance with the results obtained by American investigators that the question has arisen whether we are dealing with the same virus in America as that found in Sweden, or whether the virus has marked differences in virulence, or whether there is some experimental error or more likely an incorrect interpretation of results.

colder months. On the other hand, there are two groups of disease having their maximum seasonal prevalence during the warm weather, namely, the intestinal infections and the insect-borne diseases. Of these two groups of summer diseases the insect-borne group disappears almost to the vanishing point in temperate latitudes with wintry climates, whereas the intestinal diseases continue to smolder all winter long, with occasional exacerbations, and sometimes even with outbreaks of epidemic proportions. These are generalizations that may not be applicable to a specific case. When we study the seasonal prevalence of infantile paralysis in all parts of the world, however, we find a summer prevalence, sometimes extending into the fall, but dying down almost out of sight during the winter and spring. So far as we may judge, then, from the seasonal prevalence of this infection, it corresponds more closely with that of the insect-borne type than any other group of diseases.

If poliomyelitis is a contagious disease, then we must construct secondary theories to fit certain known facts in its distribution, seasonal prevalence and age predilection—facts which are at variance with this theory. The bulk of the cases of poliomyelitis may be very mild, and only those cases perhaps are recognized that reach the threshold of clinical observation. A similar situation would be presented if we knew diphtheria only by the cases of postdiphtheritic paralysis. Each case of poliomyelitis, in accordance with the assumption that it is spread by contacts, would be surrounded by a number of healthy carriers, but serious epidemics do not occur because the infected persons are not very susceptible. Why epidemic outbreaks should occur in rural conditions and not in the congested parts of cities is, however, not explained by this assumption. The assumed barrier of resisting individuals apparently isolates the case, but, in fact, favors the spread of the infection. It seems to be a general rule that a region where the disease has been epidemic is spared further outbreaks later. This phenomenon may be explained by assuming that a large part of the population has become immunized by having had the disease in an attenuated and unrecognized form. It is further assumed that in rural districts there is not the same opportunity perhaps to acquire immunity, and when an epidemic occurs it is liable to run an exceptionally severe course. The loopholes in these conceptions are evident to students of the disease, but it is an interesting speculation that deserves careful consideration and further study.

That infantile paralysis may be an intestinal infection has not been given the consideration that it deserves. In addition to a suggestive seasonal prevalence, there is the age incidence and gastro-intestinal symptoms which often usher in an attack; furthermore, we have the fact that monkeys may be infected by feeding, and the further important fact that the virus has been demonstrated in the intestinal mucosa, and even in the discharges from the bowels. No convincing outbreak of infantile paralysis has ever been associated with water, milk, meat, or other article of diet. Furthermore, we would expect a somewhat different epidemiology if food were a medium in transmitting the virus. The inherent unreliability of epidemiologic data, especially of a disease such as infantile paralysis, has already been noted, and the possibility of the virus entering by the digestive tube should be borne in mind by investigators. It took a long time to learn that milk may convey scarlet fever and other infections, and that pork may be responsible for trichinosis.

There has long been a suspicion that man contracts infantile paralysis from the lower animals. Hill incriminates horses. Thus, colts in Minnesota have suffered with a disease clinically like poliomyelitis, and the hypothesis has been proposed that the virus is spread through the intestinal discharges of horses, which, drying, fly about as dust. A number of other students have associated it in one way or another with horses. Joest has described in detail the lesions of a disease of horses known as *Bornasche's Krankheit*, which has a similarity to poliomyelitis. Langhorst considers a possible relationship with the dog and cites two cases, in one of which the patient was bitten by a dog; the other patient was licked by a dog, and at the same time had a few scratches on his hand. In both cases the diagnosis of rabies was not excluded. In fact, there are many striking resemblances between rabies and polimyelitis. All laboratory investigators who have worked with these two diseases have been struck with this resemblance. Both diseases are acute paralytic affections. The virus in both diseases is found in its greatest concentration and virulence in the central nervous system, but is also widely diffused throughout the body. The virus of both infections is filtrable, and in both affections the brunt of the lesions fall on the neurons of the central nervous system. There are other similarities between the two diseases which should be borne in mind, especially when studying the possible relationship between poliomyelitis and dogs.

Many observations have been made in Massachusetts and elsewhere of paralytic diseases of domestic animals occurring about the same time as poliomyelitis in man. Such paralytic diseases are common among pigs and also chickens, as well as horses, dogs, cats, etc. P. Roemer reported a paralytic disease in guinea-pigs which occurred among animals in his laboratory. The guinea-pigs died of a paralysis which has some resemblance to infantile paralysis. The infection is transmissible from guinea-pig to guinea-pig by inoculation; the virus is found to be non-bacterial, and filterable; the incubation period is from nine to twelve days; the symptoms are flaccid paralysis, usually of the hind legs, with involvement of the bladder. Microscopically there is also a resemblance in the lesions of these guinea-pigs and those of poliomyelitis in man and monkeys. Roemer, however, does not claim, and there is nothing to indicate, that this paralytic disease of guinea-pigs is identical with poliomyelitis. Neustaedter has recently noted a paralytic affection of guinea-pigs that were kept in a cage under some monkeys with experimental poliomyelitis. The evidence that any of these paralytic diseases were genuine instances of true infantile paralysis is far from convincing.

Animals suffer with many paralytic diseases, the etiology of a few of which are known, but most of which are pathologic puzzles. The mere fact that an animal has an acute paralytic infection, with perhaps suggestive lesions in the cord, is not sufficient basis for concluding that we are dealing with poliomyelitis. All attempts to transmit the virus of infantile paralysis to lower animals except the monkey, have failed. Theobald Smith, Flexner and others have made numerous attempts to carry on the paralytic diseases of pigs, chickens and other animals without success. Therefore, while it is fairly possible that some of the lower animals may suffer with poliomyelitis, perhaps in a clinically unrecognized form, and while it is possible that man may contract the infection from lower animals, the possibility is only an assumption and lacks evidence.

Another theory to account for the spread of infantile paralysis is that it is dust-borne. Hill's observations of dust and its relation to the disease in Minnesota have already been referred to. The Massachusetts State Board of Health, during the five years of its epidemiologic studies, also considered the possibility of dust as a medium of conveying the virus, without, however, discovering any particular relationship between dust and the disease. The most suggestive evidence comes from Neustaedter and Thro, who claim to have induced the disease in monkeys by inoculating them with the dust found in sick-rooms. If the virus leaves the body in any considerable amount in the secretions from the mouth and nose, it is quite conceivable that the dust of the sick-room may contain the virus, for we know that, under certain circumstances, it retains its viability for months. Poliomyelitis does not have the characteristics of a dust-borne disease, or even of an air-borne infection, and this hypothesis has therefore been given scant credence.

The possibility that poliomyelitis may be a wound infection has been kept in mind in the investigations made by the Massachusetts State Board of Health. No particular relationship between wounds and the disease has been made out. The resemblance between infantile paralysis and rabies has already been discussed, and the fact is plain that monkeys may be inoculated through wounds; in fact, it is possible to cause the disease in the monkeys in the greatest possible varieties of ways.

Some of the reasons for considering poliomyelitis an insect-borne disease have been published in some detail in another publication, and need not now be recounted. The epidemiologic evidence collected by Brues and Sheppard, and summarized by Richardson, pointed toward the stable-fly, *Stomoxys calcitrans*. The successful experiments of Rosenau and Brues, soon corroborated by Anderson and Frost, incriminate the stable-fly as a factor in the transfer of the virus. The seasonal prevalence, the rural distribution and other facts concerning the disease are explained on this theory. On the other hand, the experimental facts lack further corroboration, and, moreover, these facts have not been translated from monkey to man, and we are not justified in doing so until further studies, which are now being made, are available. Schuberg and Kuhn have recently demonstrated that a number and variety of infections may be transmitted by means of the stable-fly. In their experimental work they obtained positive results with relapsing fever, anthrax, South-west African horse sickness *(Pferdesterbe)* and epithelioma of fowls *(Hühnepocken)*.

Howard and Clark conducted a series of experiments on insect transmission with the virus of poliomyelitis, at the Rockefeller Institute, with very interesting results. It was found that the domestic fly *Musca domestica*, can carry the virus of poliomyelitis in an active state for several days on the surface of the body, and for several hours within the gastro-intestinal tract. These experiments were made by permitting the flies to feed on the virus, then killing the insects, grinding up their bodies, filtering, and injecting the filtrate into monkeys. Howard and Clark found that mosquitoes *(Culex pipiens, C. sollicitans* and *C. cantator)* did not take up and maintain in a living state the virus from the spinal cords of monkeys. Negative results were also obtained with lice *(Pediculus capitis* and *P. vestimenti)*. The experiments with lice were designed to simulate natural conditions, but it was found that these insects did not take the virus of the blood of monkeys or maintain it in a living state. The bedbug *(Cimex lectularius)*, however, gave positive results in that it was found in one experiment to have taken the virus with the blood from infected monkeys and maintained it in a living state within the body for a period of seven days. When we consider that the virus exists in the blood of monkeys in a very dilute state, for it requires a number of cubic centimeters of blood to infect another monkey, we are almost driven to the conclusion that the virus must have become concentrated (grown?) in the body of the bedbug. The results of Howard and Clark may therefore assume an enlarged significance.

If infantile paralysis is transmitted in nature largely or mainly through the agency of the stable-fly, this fact would render the suppression of the disease comparatively easy, whereas if the infection is spread largely from person to person through the intervention of carriers and missed cases, the difficulties of the problem will be multiplied manyfold. In the case of cerebrospinal fever it has been shown that carriers are ten times as numerous as the cases; if the conditions are analogous in infantile paralysis, the suppression of the disease will probably have to wait on specific therapy, of either preventive or curative nature.

The health officer impatiently asks: "Is poliomyelitis a contagious disease?" "Is it an insect-borne disease?" "Is it dust-borne?" "Is it contracted from lower animals?" "Is it an alimentary infection?" or "Is it possibly, like typhoid fever, spread by several or all of these various methods of conveyance?" In the present state of our knowledge a definite answer cannot be made to these important queries, and we must await further work before the health officer can direct his measures to combat infantile paralysis with any assurance of success. Meanwhile the public must be given the benefit of the doubt, and the infection fought along all probable lines.

65 Naples Road, Brookline.

A METHOD FOR STANDARDIZING BACTERIAL VACCINES*

J. GARDNER HOPKINS, M.D.
NEW YORK

The following method is presented as a convenient means for determining approximately the amount of bacterial substance in suspensions used as vaccines. It consists in measuring the volume of the moist bacteria after centrifugalization in a tube with a graduated capillary tip.

Experiments with various forms of tubes show that bacteria pack closely in any tip which is 1.5 mm. or more in diameter. If the capillary portion of the tube is long, the height of the column of bacteria may vary sufficiently to affect the density of the sediment, but if this portion is under 2.5 cm. in length, there is little variation in the packing. In such a tube staphylococci and typhoid bacilli pack to within 20 per cent. of the maximum density obtainable, if centrifugalized for half an hour at 2,800 revolutions per minute. I have obtained from the International Instrument Company of Cambridge, Mass., very satisfactory tubes with tips 2 to 2.5 cm. long, having a capacity of 0.05 c.c. and graduated in hundredths of a cubic centimeter. These tips are stout enough to support the pres-

* From the Pathological Department, St. Luke's Hospital, New York, Dr. F. C. Wood, Director.

sure of the tube when placed in cylindrical metal holders with rubber cushions. For preparing large amounts of vaccines I have used tubes with tips of the same length, but with a capacity of 0.1 c.c. For some time I used tubes of similar pattern made by drawing out test-tubes in the blowpipe flame, breaking off the capillary portion and sealing the tip. These were graduated by measuring various amounts of mercury into them with a pipet, and marking the corresponding levels with a diamond pencil. They are less convenient to use, however, as in order to prevent breakage it is necessary to float them in holders filled with glycerin. These tubes are the only special apparatus required, but it is convenient to use as filters small funnels made by drawing out test-tubes and placing a small plug of absorbent cotton in the broken-off tip. The open end of this improvised funnel is also plugged with cotton to prevent contamination of the interior. One requires also some capillary pipets of the usual type and an electric or water-power centrifuge of good speed. The tubes, filters and pipets are sterilized by dry heat before use.

The procedure is as follows: The sterile cotton filter is moistened with salt solution, and the funnel is placed in the mouth of the centrifuge tube. The bacterial growth is washed from the surface of an agar culture with salt solution and transferred with a pipet to the funnel. The filtration serves to remove any particles of agar or cotton that may be taken up and also the larger clumps of bacteria. The tube is then covered with a rubber cap, and, after another tube has been filled to the same point so as to balance, is centrifugalized for half an hour. The salt solution and bacteria above the 0.05 mark are then removed, and 5 c.c. of saline solution are measured into the tube. If the sediment does not reach the 0.05 mark, its volume is read on the scale and enough saline solution is introduced to make a 1 per cent. suspension. The sediment is then resuspended by forcing the salt solution into the tip with a capillary pipet and drawing the mixture in and out of the pipet repeatedly. The suspension is next transferred to a test tube to be killed in the usual manner. The tubes are washed, first in phenol (carbolic acid) and then in distilled water, the fluids being drawn into the tip with a pipet.

Special centrifuge tube with graduated tip.

It is customary to express the dosage of vaccines in terms of the number of organisms injected. Estimations made by centrifugalizing carefully counted suspensions give the following average values for a 1 per cent. suspension of the organisms commonly used when centrifugalized for one-half hour on a head 18 cm. in diameter, at 2,800 revolutions per minute. Similar values could readily be determined for centrifuges with lower speed:

	Per Cent.	Billion Per c.c.
Staphylococcus aureus and *albus*	1	= 10
Streptococcus hemolyticus	1	= 8
Gonococcus	1	= 8
Pneumococcus	1	= 2.5
Bacillus typhosus	1	= 8
Bacillus coli	1	= 4

The pneumococci used were grown on moist serum agar and had well developed capsules.

With staphylococci the method gives very constant results as compared with a direct count, as the organisms are uniform in size and pack evenly. With colon bacilli and streptococci the count of a 1 per cent. suspension varies considerably, partly because of the great difference in the size of individual organisms of different strains and partly because of inequality in the packing of the sediment. The weight of the sediment dried to constant weight in vacuo gives the best index to the accuracy of the method. On a number of determinations the weight of 0.1 c.c. of staphylococci varied from 28.6 to 34.8 mg., with an average of 31.1 mg.; 0.1 c.c. of typhoid bacilli from 22.5 to 27.0 mg., with an average of 24.7 mg., and 0.1 c.c. of colon bacilli from 10.0 to 17.5 mg., with an average of 13.2 mg.

Of the other methods of standardization probably the most widely used is the well-known one of Wright. This consists in determining the ratio of bacteria to red cells in stained smears made from a mixture of definite proportions of vaccine and normal blood. This procedure is somewhat tedious and is open to serious errors. For example, if the entire drop used in making the film is not evenly spread on the slide, the red cells accumulate in the thicker portions. Moreover, it is necessary to obtain very even suspensions, as the presence of clumps of forty or fifty organisms in some fields introduces very large errors when a total of two to five hundred is counted. Long shaking is often required to separate the bacteria satisfactorily, and in some streptococcus growths it is practically impossible to break up the clumps.

A simpler and more accurate method was suggested by Glynn and Cox.[1] The vaccine, diluted if necessary, is placed in a Helber-Zeiss counting-chamber, and the number of bacteria in a unit volume is counted directly, and the amount multiplied by the dilution. This chamber, which was designed for counting blood platelets, has a depth of 0.02 mm. (one-fifth that of the Thoma cell). This permits the use of a high-power dry objective of 3.2 mm. focal length and a No. 4 eyepiece. With intense illumination through a small diaphragm the bacteria are readily distinguished.

Callison[2] recommends diluting the vaccine 1:100 in a red cell pipet with a staining fluid of the following composition:

Hydrochloric acid ..... 2 c.c.
Bichlorid of mercury, 1 to 500 ..... 100 c.c.
Acid fuchsin, 1 per cent. aqueous solution, enough to give deep cherry-red color.

He counts in an ordinary Thoma cell. The staining does not aid greatly in making the count, and the fluid occasionally causes clumping. The use of a leukocyte or red cell pipet in diluting is, however, a great convenience. The method presents some of the same difficulties as that of Wright as the presence of clumps in the suspension makes an accurate count impossible. If an even suspension of the bacteria is obtained the direct count gives results which, when compared with the weight of the dried organisms, is somewhat more accurate than the centrifuge method. The method is, however, more time-consuming, and in making many preparations involves considerable eyestrain.

The toxicity of different strains of the same organism varies so greatly that the most exact determination of the amount of bacterial substance in a vaccine gives but an approximate idea of its strength. In standardizing stock vaccines from strains which have been used repeatedly and the toxicity of which is known, a careful

1. Glynn and Cox.: Jour. Path. and Bacteriol., 1911, xv, 360.
2. Callison: Jour. Med. Research, 1912, xxvii, 225.

direct count is of value. In making autogenous vaccines from organisms of unknown activity all that is to be desired is an approximate determination of the amount of bacterial substance in the preparation. The method of standardizing by means of the centrifuge offers the advantage of simplicity combined with an accuracy sufficient for clinical purposes.

REPORT OF A GROUP OF INFANTS INFECTED BY A TUBERCULOUS ATTENDANT*

ALFRED F. HESS, M.D.
NEW YORK

Ten children, varying in age from about 2 to 3 years, and occupying one ward in a large infant asylum, were placed in charge of a new attendant May 15 last year. We did not know at the time that this attendant recently had been ill with tuberculosis and that she had been a patient for some months at a sanatorium. Shortly afterward, toward the end of June, our attention was called to the fact that this nurse was not in good health, that she coughed, and was losing weight. Further inquiry then disclosed that she had suffered from tuberculosis of the lungs. An examination of the sputum was carried out and showed the presence of numerous tubercle bacilli.

It was now July 1, 1912. The nurse was immediately removed from the ward, but not until she had been in charge of the children for six weeks. We were naturally greatly concerned as to whether any of the children had become infected and, although they seemed perfectly healthy, resolved to observe these children with particular attention. An exceptional opportunity was afforded in this instance for studying various phases of tuberculous infection, as for some time all children on entering the institution had been subjected to a routine von Pirquet test. This test, repeated for a second time if negative, had been carried out in all wards about every six months, so that we had at hand complete data as to the previous reactions of these children to tuberculin. They had, in fact, all been tested in April. Three of the ten had been found to give a positive reaction. This was readily accounted for in one instance by the fact that the mother of the child had tuberculosis. About the middle of July, soon after the nurse left, the children were all retested, and all were found to react in the same way as three months previously (Table 1). No further tests were carried out during the summer, but in October the entire group was once more retested. The reactions had entirely changed; instead of merely three being positive, all the children in the ward now gave a positive reaction. When the test was repeated in January of this year, the same result was obtained. Such were the results of the tuberculin test.

From a clinical point of view, the condition of the children has changed very little in these months from April to the present time. None of them coughs; none shows any definite signs of tuberculosis, and although they have not all gained in weight satisfactorily, they are fairly well nourished. Possibly one exception may be made to this statement, for one child had lost in weight and attracted attention on account of his poor color. This child, however, revealed no physical signs of tuberculosis, nor did a test of the sputum from the larynx show tubercle bacilli; indeed, in the course of the past six weeks, he has improved markedly and gained considerably in weight. So that we may safely state that we have a group of young children who were exposed for six weeks to infection through a tuberculous attendant with the result that, although their health has not suffered, they all have acquired a positive reaction to tuberculin.

A report of this infection seemed particularly worthy of regard because the various factors connected with it were subject to unusually full control. In the first place, all the children had been tested with tuberculin in a routine way by the house physician before they were exposed to infection. Furthermore, we are considering a group of children who never leave the precincts of the institution, and therefore who are not exposed to infection from without. It is hardly necessary to add that, following the discovery of this tuberculous attendant, there was a thorough inquiry as to the health of other attendants throughout the institution. No other tuberculous attendant was found, nor indeed has tuberculosis developed during the past year in the case of anyone connected with the institution; so that infection from within as well as from without may be excluded.[1] We have had no other group of children in the institution develop positive tuberculin reactions. The reactions in this respect have been remarkably constant. A negative reaction on admission has almost always meant a negative reaction later; occasionally a positive reaction developed within the first few months after the child was admitted, indicating that it had been infected shortly before admission to the institution. The small group which we are recording does not, however, come under this category, as the children had been in the institution for a year or more. I shall not take the space to give a tabular account of the reactions of the

TABLE 1.—TUBERCULOUS INFECTION OF WARD *

Name.	Age, Yrs.	Von Pirquet Tests — April, 1912.	July, 1912.	Oct., 1912.	Jan., 1913
E. L.	2½	?	—	+	+
A. V.	3¼	—	—	+	+
S. S.	3	++	+++	+	+
S. O.	3	—	—	+	+
R. S.	2½	+	+++	+++	+
A. S.	3¼	—	—	+	+
M. G.	3	—	—	+	+
L. S.	3½	—	—	+	+
S. B.	3	+	+	++	+
R. F.	2	—	?	+	+

* Nurse with open tuberculosis in charge of children from May 15 to July 1.
? Mother tuberculous.

TABLE 2.—ROUTINE TESTS OF SOME CHILDREN IN OTHER WARDS (1912 AND 1913)

Name.	Age, Yrs.	Von Pirquet Reaction 1912.	1913
L. A.	5	—	?
V. A.	3	—	—
A. A.	4½	+++	+
H. A.	4	—	—
E. A.	4½	+++	+
B. A.	3	—	—
S. A.	4½	—	?
S. A.	5½	++	+
A. B.	4	—	—
M. B.	¾	—	—
C. B.	4	—	—
B. B.	3	++	+
B. B.	¾	—	—
G. B.	2	—	—
C. B.	1½	+	—
S. B.	3	+	+

* From the Research Laboratory, Dept. of Health, New York.

1. All the milk which is furnished the institution has been thoroughly pasteurized by being subjected to a temperature of 145 F. for 45 minutes, a degree of heat which kills all tubercle bacilli.

three hundred children of the institution, but as an illustration give a table showing the reactions of some children (those whose names begin with the letters A and B) in order to show the constancy of the tests from year to year (Table 2). It will be seen that negative reactions do not become positive in the institution. There has been no instance in which we have met two negative reactions followed by a positive reaction, such as we see throughout the table showing the ward infection (Table 1).

We must conclude, therefore, that these children were all infected by this attendant during a period of exposure of six weeks. It should be mentioned, however, that a contributing cause of this wide-spread infection was probably the fact that during this period the children had stomatitis, and that this nurse was entrusted with the treatment of their mouths. We should also consider, however, that she was not an ignorant person, although not a graduate nurse; and we should have expected her, during a six-months' stay in a model sanatorium, to have acquired more than an average knowledge of the principles of prophylaxis in relation to tuberculosis.

A wide-spread ward infection of this nature shows how it comes about that we all, with few exceptions, become infected with tubercle bacilli and react to tuberculin by the time we reach adult life. It also suggests that individual susceptibility is not an important factor in relation to infection by tubercle bacilli. Given a source of infection, it is probable that every individual becomes promptly infected who has not been naturally immunized by previous contact with tubercle bacilli. Although this is true as to infection, it probably does not hold true as regards the further course of the disease; herein susceptibility plays a rôle, helping to determine whether the focus is rendered latent or allowed to progress.

154 West Seventy-Second Street.

OILY INJECTIONS OF SALVARSAN—A WARNING

H. H. HAZEN, M.D.

Professor of Dermatology, Georgetown University, Clinical Professor of Dermatology, Howard University

WASHINGTON, D. C.

From time to time injections of salvarsan in an oily medium have been recommended by various men, notably by Levy-Bing and Lafay,[1] Kromayer,[2] Pollitzer[3] and Hazen.[4] All of these men have, I believe, given up this method of administration in favor of the intravenous route, but without publishing their reasons for so doing. In view of the fact that a number of our best drug houses are now marketing preparations of salvarsan in oil, it seems wise to state my experience with this form of injection.

Up to the present time I have given fifty-eight of these injections to forty-four individuals. Fifty-two of the injections were of salvarsan, and six of the neosalvarsan. In general the effects on the lesions and on the Wassermann reaction were excellent. In the majority of instances the immediate results, so far as pain and disability are concerned, have also been excellent. Twenty of the injections were practically painless, and only twelve caused pain that was at all severe. Morphin was required in but three instances. Only three patients lost time from work, one about ten days and the other two not over two days each. There has not been a single patient who was not willing to take another injection.

There is a more serious side, however, especially when the patients are followed for a considerable length of time, and some of the immediate evil consequences cannot be ignored. Four cases presented complications shortly after injection; two developed slight abscesses of no particular import; one developed peripheral phlebitis about two weeks later; but the most serious accident was pulmonary embolism, the patient fortunately recovering in about two weeks.

In six instances abscess at the site of injection developed in from three to twenty-four months after treatment. In one of these patients both buttocks broke down about three months after injection, although the injection was unilateral. In this case it is rather difficult to hold the salvarsan responsible for either side. In the most interesting case of this series exactly two years after the administration of salvarsan an abscess pointed in the buttock. It was opened, and about 6 ounces of sterile pus and considerable tissue debris were evacuated. In another case five small injections were given at biweekly intervals without any especial trouble, but about three months after the last both buttocks became red, swollen and painful, with distinct fluctuation. Operation was refused, and the swellings resolved in about two months; but even now, one year later, are still sore and tender on pressure. Several other men have told me of similar experiences, the longest interval between injection and abscess being one year. One other patient has had permanent nodules left in his buttocks, and complains bitterly of pains radiating down both sciatic nerves.

It is rather difficult to account for this late trouble except on the hypothesis that the material injected is toxic to tissue at the site of injection, and that this dead tissue, if not absorbed, may act as a foreign body. In the abscesses that I have opened no trace of the salvarsan could be found, and in all of them the therapeutic effect had been marked.

After the use of neosalvarsan in water as recommended in the circular accompanying the ampule one must be prepared for severe pain. I have seen one patient rendered absolutely helpless for three weeks; suffering more than from any type of injection that I have ever used. Nor does the administration of neosalvarsan in glycerin, as suggested by Wolbarst,[5] work any better; both of the patients on whom I tried it suffered severely. I have found that the oily injections of neosalvarsan are more painful than when salvarsan is used. One tabetic had four treatments with salvarsan without the slightest discomfort, but the newer preparation kept him in bed for ten days. Out of six injections three patients experienced great discomfort.

In view of the tendency for late abscess formation following oily injections, and in view of the pain of all other methods, I feel that the intravenous method should be the only one employed, remembering, of course, that it should be used very carefully in certain cases, notably those with disease of the heart or central nervous system.

The Rochambeau.

1. Levy-Bing and Lafay: Bull. Soc. franc. de dermat. et de syph., 1910, xxi, 217.
2. Kromayer: Berl. klin. Wchnschr., 1910, xlvii, 1698.
3. Pollitzer: New York Med. Jour., 1911, xciii, 403.
4. Hazen, H. H.: Washington Med. Ann., 1911, x, 181; 1912, xi, 199
5. Wolbarst: Med. Rec., 1912, lxxxii, 148.

NEW ETHER PAD AND CONE

EDWIN M. JONES, M.D., MIAMI, FLA.

The illustrated pad and cone were devised to make the administration of ether more agreeable to the patient and infinitely easier for the administrator as compared with the methods now used in over 85 per cent. of the hospitals.

Unless the anesthetic is in the hands of a professional it is usually given by using an Esmarch cone, towels, petrolatum, rubber tissue and moist cotton for the eyes, all of which are useless and hard to handle, and before the patient is asleep they are usually out of place and the eyes exposed to the ether vapors. The cone in this case does not fit, consequently the vapors escape down the sides of the patient's face, hence the waste of ether; and the administrator has no idea of the ether percentage he is giving, but hopes the patient will soon be asleep so he can arrange the towels, which he usually does at the wrong time. The patient at this period should have a lower ether percentage.

In a great many hospitals which I have visited the interns give the anesthetic and they having just graduated, invariably used the method described, because it is the custom.

To correct this I suggest, especially to the novice, the use of the pad and open ether method.

The pad consists of absorbent cotton about 1 inch thick, 8 inches wide and 12 inches long, with an aperture in the center 1 inch wide and 2 inches long. The cotton is covered with two plies of gauze and sewed round the edges. The cone is similar to the Esmarch without the handle and is used as illustrated.

ITS ADVANTAGES

It does away with the use of petrolatum as only the vapor comes in contact with the skin and does not burn.

It does away with the use of towels.

It does away with the use of moist cotton or rubber tissue for the eyes.

It fits the face and feels comfortable to the patient and ether vapors do not escape down the sides.

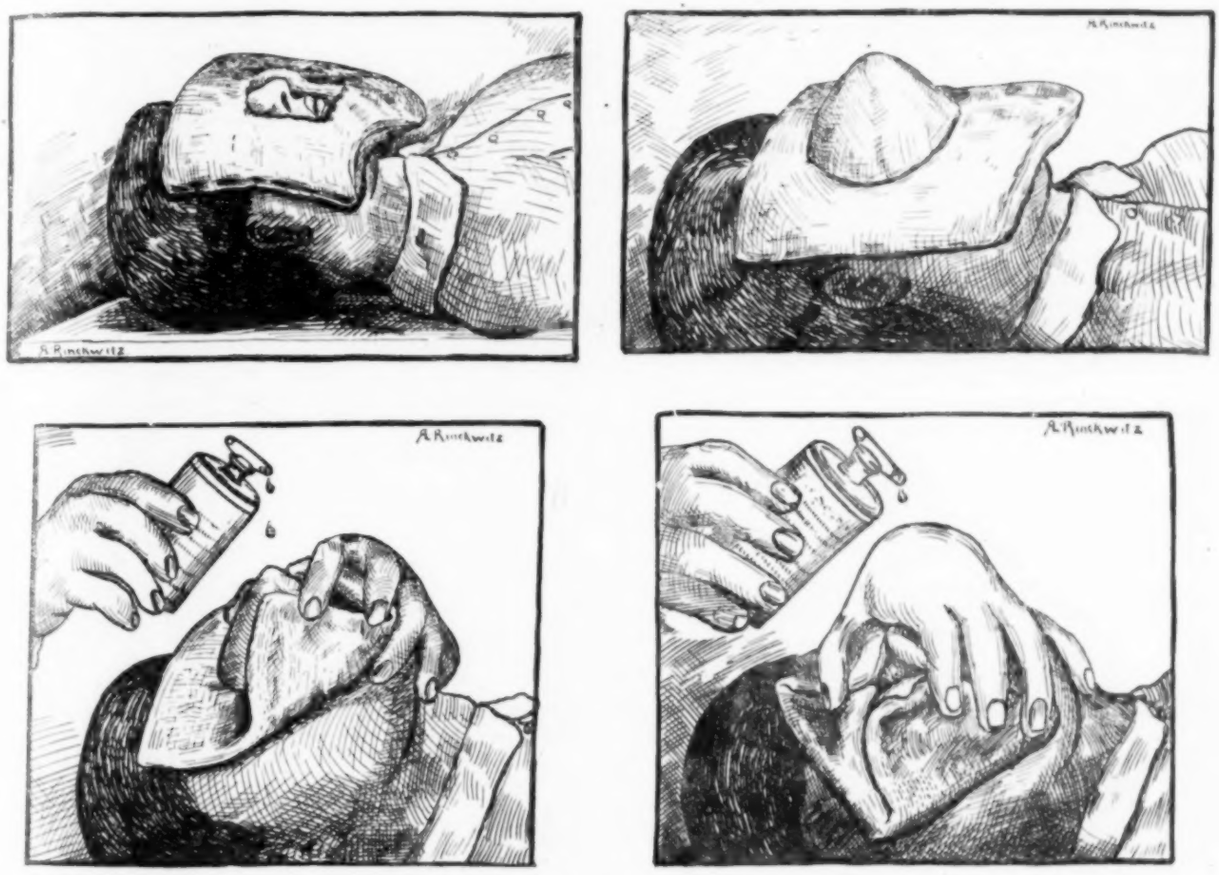
It enables the anesthetist to regulate the ether percentage by folding the corners as illustrated.

It does not get out of order by the patient moving his head during the stage of excitement.

It is easy to carry and cheap, costing approximately five cents each and can be re-used six or eight times by sterilizing.

I have used this method in 500 cases and think it worth mentioning.

909 Avenue C.



New ether pad and cone, showing successive steps in use.

A METHOD OF CONTROLLING RECTAL HEMORRHAGES

B. L. MYERS, A.B., M.D., OMAHA, NEB.

While serving as intern in Immanuel Hospital, I was called to see a patient 74 years old, who had been operated on four days previously for very large thrombotic hemorrhoids, which had become gangrenous. He was quite exsanguinated; the dressings were soaked, and a small stream of blood was flowing from the rectum.

The patient was removed to the operating-room and I soon ascertained that the hemorrhage was taking place inside the sphincter, considerable quantities of blood being expelled periodically, after the "whistle tube" was withdrawn.

I packed the rectum with cotton saturated with epinephrin (adrenalin chlorid), as the surgeon in charge telephoned me to do, but without giving relief. I then packed with gauze, but this too failed. I then resorted to the following method:

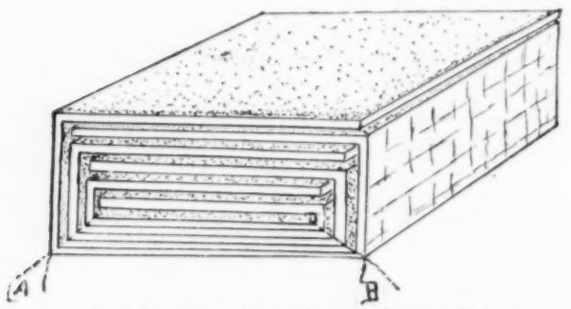
Taking a piece of gauze about 18 inches square, I spread it in a single layer over a Kelly proctoscope, rubbed petrolatum into it thoroughly and inserted the proctoscope into the rectum well past the sphincters. The obturator was then withdrawn and the invaginated piece of gauze was packed, through the proctoscope, with a 10-yard 1-inch gauze bandage, withdrawing the proctoscope as the invaginated gauze was ballooned up. When the packing filled the rectum and the proctoscope was withdrawn, the loose edges of the invaginated gauze were twisted tightly together, which bound the packing into a hard mass. The hemorrhage stopped completely at once.

Thirty-eight hours later the packing was withdrawn with perfect ease, without hurting the patient or starting the hemorrhage again, by catching the external end of the bandage used as packing and drawing it out. This allowed the invaginated piece of gauze to collapse and slip out without the slightest dragging on the tender mucous membrane. The patient was discharged from the hospital three weeks later in good condition and without further hemorrhages.

A PLASTER-OF-PARIS SPLINT

M. D. TOUART, M.D., NEW YORK

Every surgeon using molded plaster-of-Paris splints in the treatment of fractures has been more or less annoyed by the great amount of manipulation and soiling and the time required in the making of such splints. To overcome these disadvantages I have devised means for preparing plaster-of-Paris splints in a dry state so that they may be kept until needed.



Method of preparing plaster-of-Paris splint.

Several layers of unstiffened gauze, three times the width of the desired splint, are stitched together lengthwise along two lines (*A* and *B* in the diagram), so as to divide them into three equal parts. Plaster of Paris is applied to the middle third and rubbed into the cloth in the usual manner. A layer from one of the outer thirds is now folded to the center, and plaster applied to it. Then the corresponding layer of the remaining third is treated in like manner, and so on until all the interstices are filled. When completed, the splint consists of several alternating layers of gauze and plaster thoroughly incorporated into one composite whole.

I have used for some time such splints of various lengths and widths and find them most satisfactory. They are prepared as described above, folded lengthwise to a convenient size and securely enclosed in paraffined paper. With a piece of surgical lint of sufficient size for padding, they are placed in a box forming a package easy to carry in any surgical bag.

For use, the splint should be folded crosswise and stood on end under water until thoroughly moistened. The excess of water is then expressed and the splint smoothed out on a flat surface until wrinkles have been removed. With the strip of surgical lint as padding the splint is applied to the part, bandaged firmly and allowed to harden. It is then removed, the ends and corners rounded, or shortened if necessary, and replaced with adhesive plaster retaining-straps. The time required in the application is short, the manipulation slight and the soiling need not extend beyond the surgeon's hands.

The great value of such a splint, aside from its convenience, is apparent. It may be applied from the moment a fracture occurs. It may be loosened to accommodate swelling or tightened as the swelling disappears. It allows of inspection, massage or other treatment at any time. It is a most efficient agent for immobilization by virtue of its fitting the part with accuracy and having no thick padding to favor displacement. It is exceedingly comfortable, being light and exerting an even pressure throughout its whole length. It has sufficient durability to last throughout the period of treatment. In a word, it is a splint that will give both patient and surgeon the utmost satisfaction.

450 West One Hundred and Forty-Fifth Street.

A NEW TONSILLECTOME*

J. ELLIS JENNINGS, M.D., ST. LOUIS

This new tonsillectome was designed to remove the tonsil in its capsule by the Sluder method. The essential and distinctive feature of this operation is the moving of the tonsil completely out of its normal bed forward and upward onto the eminence of the lower jar produced by the last molar tooth, and the utilization of this prominence in putting the tonsil through the aperture of the guillotine. For this operation a tonsillectome of great strength and leverage power is essential. To attain these ends Dr. Sluder has modified the Physick-Mackenzie guillotine by doubling the thickness of the shaft, shortening its length and making the handle longer. In using this instrument with its dull blade I found considerable difficulty in exerting sufficient pressure with the thumb to cut through the tissues. In consequence they were bruised and torn before the tonsil was removed.

A new tonsillectome.

In thinking over the matter it seemed to me: (1) that the best way to remove a tonsil was to cut from behind forward; (2) that when the whole tonsil was through the ring its attachments should be cut off cleanly with a sharp blade, and that when they had been severed in this way the hemorrhage would be little greater than if the blade were dull, and (3) that it was much easier to pull with the finger than to push with the thumb. Therefore I began to study the possibilities of the Fahnestock-Mathiew tonsillotome with its ring-knife to cut on the pull. I found it was not adapted to the Sluder operation because any attempt to exert a leverage force caused a painful pressure of the rings against the bones of the fingers. So I discarded the rings for the fingers and the elevating prongs, greatly strengthened the supporting blade, added a strong handle and trigger, and evolved what might aptly be called the pistol guillotine. It is very strong. The pistol grip enables the operator to exert all the leverage force required to put the tonsil through the aperture, and the sharp ring-knife cuts the attachments of the tonsil by a natural movement of the finger on the trigger. By lifting and turning the small plate above the handle, one may take the instrument apart in a second.

508 Carleton Building.

* Read before the oto-laryngologic section of the St. Louis Medical Society, March 26, 1913.

AN ORIGINAL METHOD OF TESTING FOR POTASSIUM IODID IN THE URINE†

HENRY POWER, M.D., SPOKANE, WASH.

The use of the internal administration of potassium iodid in doses of one or more grams and a subsequent series of tests of the urine that its total period of elimination may be determined has come to be considered as a practical test for the functional activity of the kidney. The drug is expected to disappear in about fifty hours. Heretofore the urine has been subjected to the action of fuming nitric acid and then washed with chloroform, the iodid color appearing in the globules of the latter solvent.

Believing that this test had many factors in common with the tests for indican, I set about devising the following method, which is able to indicate the presence of the drug in one-fifteenth part of 1 per cent. and is at the same time free from the objection of possible confusion with the indican reaction.

Materials Required.—A, boiled starch solution. B, a small platinum or carbon electrode. C, any convenient source of direct electric current. D, a white evaporating dish.

Test.—Urine is mixed with starch solution in the dish and the two electric poles immersed in the fluid; the positive or carbon pole being of platinum or carbon. A current of from 3 to 10 milliamperes is allowed to flow through the liquid mixture and in a few seconds the starch about the positive pole is seen to turn blue as a result of the iodin set free from combination by the action of the current.

421 Old National Bank Building.

Special Article

BACTERIAL VACCINE THERAPY: ITS INDICATIONS AND LIMITATIONS*

(Continued from page 1541)

INOCULATION TECHNIC

Bacterial vaccines are administered by subcutaneous injection. Attempts to administer them by the mouth or by rectum have not progressed beyond the experimental stage. Intravenous and intramuscular injections are not practiced as a rule.

Syringe.—While the physician's ordinary hypodermic syringe can be used, a special syringe should be set apart for vaccine therapy. Preferably this syringe, or at least its barrel, should be of glass, accurately graduated either in minims or in fractions of a cubic centimeter. A capacity of 1, or at most 2 c.c. is sufficient. The plunger may be of metal to fit a ground barrel, of glass ground to make a good fit, or of glass with asbestos packing. Ordinary steel hypodermic needles with slip-joint or screw-joint rust readily and dull when sterilized by boiling, but they are cheap as compared with the more durable needles of platinum or gold. A simple glass-barreled syringe with asbestos-packed glass plunger, graduated according to the apothecaries' measure or the metric system, with two steel needles, is inexpensive and satisfactory.

Sterilization of the Syringe.—Boiling in water for five or ten minutes is the most satisfactory method of sterilizing the vaccine syringe. When the water is hard, the layer of salts deposited on the syringe and plunger must be dissolved occasionally with hydrochloric acid. After use the syringe should be rinsed with boiled water to remove traces of vaccine, and then rinsed with alcohol, the special object of which is to prevent the internal rusting of the needle. When the syringe is in daily use it can be left filled with alcohol until next day.

Vaccine Container.—The most convenient container for bacterial vaccine is the vaccine bottle of Wright—a bottle of convenient size covered with a tightly fitting rubber cap of sufficient thickness. Such a bottle holding 25 c.c. answers admirably for stock vaccines. For concentrated suspensions or for individual autogenous vaccines a 4-dram homeopathic vial covered with a heavy rubber test-tube cap, or two thinner test-tube caps, answers all purposes. In using such a container, a drop of liquor cresolis compositus is placed on the rubber cap, the bottle shaken, the needle plunged through the cresolized area on the cap, and the vaccine withdrawn from the inverted bottle into the sterilized syringe. With a cap of suitable thickness, or a double cap of thinner rubber, the puncture seals itself, and vaccine can be withdrawn repeatedly through freshly cresolized punctures.

Market vaccines in bulbs or bottles of single doses are withdrawn into the sterilized syringe; one should not forget to invert the bulb or narrow-necked bottle during the withdrawal of the vaccine.

Shaking the Vaccine.—In all vaccines the bacteria sink to the sides or bottom of the container if undisturbed. Hence the necessity of vigorous shaking to secure a uniform suspension.

Injection-Site.—It is important to choose a proper site for inoculating bacterial vaccines. Physicians daily make glaring mistakes in this seemingly simple matter. Although the upper arm is not usually suitable as the inoculation site, physicians not uncommonly make repeated inoculations in this restricted area, resulting in a series of indurations painful to the patient and defeating the immunizator's purpose. For the two or three injections required in antityphoid inoculation, it is permissible to use the upper arm, provided a fresh site is chosen for each injection; but the tense skin of the upper arm is a drawback, and local reactions are more severe because of the muscular movements. If possible, one should select a site with thin, loose integument. The infraclavicular region on both sides in an area as large as the outstretched hand is suitable. The skin over this site is thin and loose and the area sufficient to furnish a fresh point for each of a number of inoculations. In women with exceptionally large breasts, inoculating over mammary tissue should be avoided.

Other regions often recommended have certain disadvantages. In adults, the integument of the back, either in the interscapular region or over the buttocks, is two or three times as thick as that on the front of the body, and adheres tightly to the underlying tissues. In infants and young children whose skin is tender and loose, inoculations are permissible in the back or upper part of the buttocks. Over the abdomen there is usually a well-developed layer of fat to which the skin sticks tightly, and persistent indurations commonly follow inoculations in this region. In the legs there is the objection of pain from muscular movement, though the inner upper thigh is a much better locality than the arm.

Repeated Localized Inoculations.—Whatever the site of inoculation, repeated injections in a circumscribed

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* This series of articles has been prepared under the direction of a committee appointed for the purpose by the Council on Pharmacy and Chemistry of the American Medical Association. The committee consists of Drs. Ludvig Hektoen, Chicago; David L. Edsall, Boston; John Howland, Baltimore; Reid Hunt, Washington, D. C., and Albert P. Ohlmacher, Detroit.

† Described and demonstrated at the meeting of the Spokane County Medical Society, April 10, 1913.

area should be avoided, a new site being chosen for each inoculation of a series.

The Injection Proper.—As preparatory to the injection, a drop of liquor cresolis compositus may be placed over the skin to be punctured, or the surface may be mopped with alcohol. The integument is lifted into a convenient fold, and the needle plunged through the disinfected area perpendicularly to the surface or nearly so, to avoid the more painful thrust at an angle. Making sure that the point of the needle lies in the loose subcutaneous tissue, the operator discharges the vaccine. It is superfluous to seal the puncture, which may be wiped with a pledget of cotton moistened with alcohol. There is no necessity of forcing out a portion of air that may have been drawn into the syringe with the vaccine, for the injection of this air into the subcutaneous tissue is entirely harmless, and when the syringe is held upright, serves to force the last portion of vaccine from the barrel and needle.

Occasionally a minute vein is punctured during the inoculation, and a hemorrhagic ecchymosis follows which sometimes alarms the patient. Should a swelling indicate that the fluid has been enmeshed in dense connective tissue, the swollen area should be gently massaged and the swelling reduced.

LOCAL REACTION TO BACTERIAL INOCULATION

After the disturbance of the immediate injection subsides there is usually a period of freedom for from three to twelve hours, depending on the dose and the nature of the bacteria. Then the injection site may become tender, at least on pressure. With this tenderness may come a more or less marked inflammatory blush, and in twenty-four hours there is often a moderate swelling, sometimes soft, sometimes indurated. Not uncommonly the tenderness, redness and swelling are entirely absent. With larger doses, more irritating bacteria or greater susceptibility, the local reaction may be more pronounced, even to the point of producing quite extensive reddened areas or large indurations which sometimes persist unduly. Usually these more pronounced local reactions indicate excessive dosage and are to be avoided. Likewise a persistent and tender induration is an undesirable consequence, and as a general rule one should wait until it has subsided before repeating an inoculation. With a nicely adjusted dose, marked therapeutic response is usually obtained with little or no local reaction.

GENERAL REACTION TO BACTERIAL INOCULATION

The systemic effect of a therapeutic bacterial inoculation has been studied by means of the opsonic index, and also through the symptomatic response. This effect varies according to the infection under treatment, the idiosyncrasy of the patient, and the dose of injected bacteria.

Negative Phase.—The opsonic index usually falls in the first twenty-four hours after inoculation, a depression which Wright styled the "negative phase." This opsonic negative phase persists for a varying time, but with well-adjusted dosage remains but a day or two and is succeeded by a rising opsonic index constituting the "positive phase." Excessive doses produce a prolonged depression of the opsonic index; minute doses usually induce a short negative and short positive phase.

Symptomatically the negative phase is to be recognized by slight general disturbances like malaise, anorexia, nausea and headache; an elevation of temperature of a degree or two appears in from six to twelve hours after the inoculation, and there is temporary aggravation of localized infectious processes, if such exist, as shown by increased inflammatory reaction or more copious suppuration. These phenomena indicate the symptomatic negative phase, and like the depression of the opsonic index may be short and fleeting or prolonged and intensified, depending on whether the dose has been adequate or excessive.

Positive Phase.—The symptomatic positive phase is ushered in by a general feeling of well-being amounting at times to remarkable buoyancy and a relief of the general symptoms; improvement in local conditions is shown by diminished inflammatory reactions, relief of pain and lessened suppuration.

In a series of successful inoculations the wave of immunizing response as determined by the opsonic index becomes less sharply marked after successive injections, and ultimately there may come a prolonged positive phase—the "sustained high tide of immunity," as Wright calls it. Symptomatically this much-to-be-desired result is manifested by steady improvement, both local and general, resulting in final recovery. The ideal toward which all bacteriotherapists strive is the attainment of this sustained high tide of immunity with the fewest possible inoculations, reducing the degree and duration of the negative phase, and quickly securing a prolonged positive phase.

When the exactly suitable dose of the correct vaccine has been inoculated, one at times witnesses a symptomatic positive phase established so quickly as to make the symptomatic negative phase unrecognizable. With no preceding depression, a pronounced clinical improvement both local and constitutional may manifest itself in from six to eighteen hours after an inoculation, and occasionally a single inoculation such as this will appear to effect symptomatic recovery.

DOSAGE OF BACTERIAL VACCINES

Next to the selection of the precise vaccine suited to the individual case comes the dosage. Many failures arise from the use of wrong vaccines, but still more unsatisfactory results follow errors in dose and in inoculation interval.

The dosage of vaccines has a wide range. It may vary from 10 million bacteria per dose to 1,000 million or more. The dosage is influenced by the nature of the infection and also by individual susceptibility. The latter condition has not been sufficiently recognized. The dose of a certain bacterial species for one person with a certain infection may be 10 million, while for another person with the same infection a dose of 1,000 million or more may be required—an increase of dosage of a hundredfold or more. Under these circumstances, the difficulty of supplying a satisfactory working formula is obvious. This complexity makes it clear that vaccine therapy demands experience and extensive special knowledge.

A prolonged negative phase, as shown by the opsonic index, indicates an excessive dose, while a short negative phase followed by a short positive phase suggests that the dose has been too small. The symptoms also furnish a guide. Extensive redness, tenderness and induration at the injection-site, with prolonged exacerbation of local lesions and of constitutional symptoms must be accepted as a warning of extreme dosage. Slight local reaction and fleeting improvement or none at all indicate insufficient dosage.

(To be continued)

STATE BOARD STATISTICS FOR 1912

THE ANNUAL PRESENTATION BY THE COUNCIL ON MEDICAL EDUCATION OF RESULTS OF STATE BOARD EXAMINATIONS

On pages 1624 to 1633 are three tables, A, B and C, giving in detail the results of the various state medical license examinations held during 1912. Complete reports were received for publication from all states except Pennsylvania.

Tables A and B have been arranged so that, read from left to right, they give the results by colleges, showing the number of graduates appearing for examination in each state, whether they passed or failed, the total number examined during the year, the number who passed, the number who failed, the percentage of failures and the number of states in which graduates of each school appeared for examination. Read from above downward, they give the results by states, showing the number registered and rejected from each college, the total number examined, the total number registered, the total number rejected and the percentage of rejections. The fact that the majority of graduates take the license examination in the state in which the college is located is shown by the dark diagonal zone made by the grouping of figures, passing from the upper left to the lower right corner of each table. This shows also that the states which harbor low-grade medical schools are themselves the recipients of the greater portion of the ill-trained output of such schools. These tables are worthy of much careful study, for many important deductions are possible.

Caution in Forming Conclusions

In making comparisons on the basis of these statistics several factors should be carefully considered. The number examined is important since, if all other conditions are equal, the larger the number of graduates examined, the more accurate is the finding. But other conditions are seldom equal. The number of states in which a school's graduates have been examined is important. The larger this number the more accurate will be the conclusions. Again, the character of the board making the examination and the methods employed are important factors to be considered, since some boards hold very careful examinations and include practical laboratory and clinical tests, or they may mark the papers more severely, while others, especially partisan boards, may be very lenient. In this connection it should be stated that although conditions are undergoing a steady improvement it is still true that the character of the license examination as usually conducted at the present time is such that graduates of colleges conducted largely by quiz-class methods may easily be successful in passing them. Therefore, the statistics herewith presented should be taken only as part of any investigation of medical schools, although it is an important part.

Graduates of All Years Examined in 1912

Table A shows the results for all candidates who took examinations in 1912 regardless of the years in which they graduated. This shows that altogether 6,353 were examined last year, as compared with 6,960 in 1911; 7,004 in 1910; 7,287 in 1909, and 7,770 in 1908. Of those examined 17.8 per cent. failed, as compared with 19.9 per cent. in 1911; 18.4 per cent. in 1910; 19.6 per cent. in 1909, and 21.7 per cent. in 1908. The omission of the figures from Pennsylvania accounts for the smaller totals appearing in this and other tables.

There were 110 medical colleges in the United States granting degrees in 1912, which had graduates examined. Foreign graduates were examined in twenty-six states, the total number being eighty-eight and of this number thirty-five or 39.8 per cent. failed. The largest number of foreigners examined in any state were twenty in New York. Graduates of Canadian schools were examined in twenty-two states, more appearing, naturally, in the border-line states. The figures for the Canadian colleges are given separately in order to show the number of candidates coming from each as well as to show the successes of their graduates at the examinations. Altogether seventy-four candidates from Canadian colleges were examined, of which number eighteen or 24.3 per cent. failed. Of all Canadian colleges, the McGill University had the largest number examined. The highest percentages of failures were for Laval University, 52.6, and Queen's University, 41.7.

Undergraduates Examined During 1912

Line 120 of Table A shows the number of non-graduates examined in four states during 1912. Altogether 253 non-graduates were examined, of which number eighty-eight or 35.0 per cent. failed as compared with 38.5 per cent. in 1911 and 45.6 per cent. in 1910. Such candidates were examined during 1912 in Colorado, Maine, Massachusetts, Oregon and Tennessee. The largest number registered was in Tennessee where, out of the 313 candidates registered by examination during the year in that state, 142, or 45.4 per cent., were non-graduates. In 1911, 51.6 per cent of all candidates licensed by examination were non-graduates, and in 1910 45.1 per cent. were non-graduates. In the last five years in Tennessee of the 1,331 physicians licensed, 525 or 39.4 per cent. had not previously graduated from medical colleges. Meanwhile, Tennessee is now the only southern state which has the door wide open for this sort of candidates.

Recent Graduates Examined During 1912

Table B gives the results for graduates of 1908 to 1912 inclusive, which were examined during 1912. This table is particularly important, since it deals with recent graduates and is, therefore, the fairest basis for comparison between colleges. The fairest estimate of a medical college from the standpoint of failures at state board examinations would be obtained from this table. Of all candidates examined in 1912, 5,257, or 82.7 per cent., were recent graduates, and of this number 17.4 per cent. failed, as compared with 17.8 per cent for all candidates. The figures for several medical schools which have ceased to exist either through merger or otherwise have been included in the line for miscellaneous colleges.

Old Practitioners Examined During 1912

Table C is so arranged as to show in comparison the results for graduates of all years (first column), for recent graduates (second column), the graduates of 1907 and previous years (third column), and the graduates of 1912 (fourth column.) Of the graduates of 1907 and previous years, or "old practitioners," 843 were examined and of this number 240 or 29.1 per cent. failed as compared with 17.4 per cent. of failures for recent graduates. This high percentage of failures is probably due chiefly to the long time these candidates have been out of college and to the fact that they are required to take the same examination as recent graduates. Undoubtedly the less favorable conditions in medical colleges at the time these physicians graduated have some bearing on this result. Justice to such candidates, most of whom have already been licensed, but who, for good reasons, may desire to change their locations, is the strongest argument for interstate reciprocity in medical licensure, or for special percentage allowances at the examinations for years of practice. The total number of these candidates will naturally diminish each year as increased reciprocal relations are established since, as a rule, the states which do not have reciprocal relations with other states (e. g., California, Florida, Washington, see Table L) examined the largest numbers of old practitioners.

Graduates of 1912 Examined During 1912

Table C also gives the results for the graduates of 1912 who were examined during the year by state boards, and

CONTINUED ON PAGE 1634

Marginal Number	NAME OF COLLEGE	1 Alabama P	1 Alabama F	2 Arizona P	2 Arizona F	3 Arkansas P	3 Arkansas F	4 California P	4 California F	5 Colorado P	5 Colorado F	6 Connecticut P	6 Connecticut F	7 Delaware P	7 Delaware F	8 District of Columbia P	8 District of Columbia F	9 Florida P	9 Florida F	10 Georgia P	10 Georgia F	11 Idaho P	11 Idaho F	12 Illinois P	12 Illinois F	13 Indiana P	13 Indiana F	14 Iowa P	14 Iowa F	15 Kansas P	15 Kansas F	16 Kentucky P	16 Kentucky F	17 Louisiana P	17 Louisiana F	18 Maine P	18 Maine F	19 Maryland P	19 Maryland F	20 Massachusetts P	20 Massachusetts F	21 Michigan P	21 Michigan F	Marginal Number
	ALABAMA																																											
1	Birmingham Medical College.—R	20	22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	3	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
2	University of Alabama, Med. Dept.—R	21	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	0	..	..	..	..	..	..	..	..	2
	ARKANSAS																																										
3	College of Physicians and Surgeons.—R	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
4	Univ. of Arkansas, Med. Dept.—R	..	..	..	..	40	9	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	4
	CALIFORNIA																																										
5	College of P. and S., Los Angeles.—R	..	..	1	0	..	..	24	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6	College of P. and S., San Francisco.—R	..	..	..	..	..	..	2	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
7	Cooper Medical College.—R	..	..	..	..	..	..	30	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	Hahnemann Medical College of the Pacific.—H	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Oakland College of Med. and Surg.—R	..	..	..	..	..	..	6	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	Univ. of California, Med. Dept.—R	..	..	..	..	..	..	33	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10
	COLORADO																																										
11	Univ. of Colorado, Med. Dept.—R	..	..	..	..	..	..	4	1	30	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	11
	CONNECTICUT																																										
12	Yale Medical College.—R	..	..	..	..	..	..	..	..	..	..	18	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	2	0	..	..	12
	DISTRICT OF COLUMBIA																																										
13	George Washington University.—R	..	..	..	..	..	..	2	0	..	..	..	..	..	..	21	2	..	..	1	0	1	0	2	0	..	..	1	0	..	..	..	..	..	..	..	..	2	1	..	..	1	0	13
14	Georgetown University, School of Med.—R	..	..	..	..	..	..	..	..	..	..	2	0	..	..	13	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	14
15	Howard University, Med. Dept.—R	0	1	..	..	..	..	1	0	0	1	..	..	..	..	5	0	4	0	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	1	1	..	..	15
	GEORGIA																																										
16	Atlanta College of Physicians and Surgeons.—R	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12	1	53	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16
17	Atlanta School of Medicine.—R	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	45	1	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	0	2	..	..	17
18	Georgia College of Eclectic Med. and Surg.—E	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18
19	Southern College of Med. and Surg., Atlanta.—R	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19
20	Medical College of Georgia.—R	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	3	31	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
	ILLINOIS																																										
21	Bennett Medical College.—R	1	0	..	..	1	0	1	1	..	..	..	..	..	..	..	..	2	0	..	..	..	..	49	14	1	0	2	0	..	..	..	..	..	..	..	..	..	..	1	0	2	0	21
22	Chicago Coll. of Med. and Surg.—R	..	..	1	0	3	1	1	0	2	0	..	..	..	..	..	..	1	0	..	..	1	1	25	24	4	0	5	0	1	0	..	..	..	..	..	..	..	..	1	0	..	..	22
23	College of Physicians and Surgeons.—R	..	..	..	..	..	..	13	4	..	..	..	..	..	..	..	..	1	0	..	..	3	0	12	25	3	0	13	1	1	0	..	..	..	..	..	..	..	..	..	..	8	0	23
24	Hahnemann Medical College and Hospital.—R	..	..	..	..	2	0	1	2	..	..	1	0	..	..	1	0	1	0	..	..	..	..	18	12	3	0	4	1	..	..	..	..	..	..	..	..	1	0	..	..	1	0	24
25	Hering Medical College.—H	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	2	2	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	25
26	Jenner Medical College.—R	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26
27	Northwestern Univ. Med. School.—R	2	0	1	0	..	..	6	1	1	0	..	..	..	..	..	..	..	..	..	..	5	1	68	6	4	0	11	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	27
28	Rush Medical College.—R	1	0	5	0	..	..	12	3	1	0	0	1	..	..	..	..	2	0	..	..	1	0	74	2	1	0	7	0	5	0	..	..	..	..	..	..	..	..	..	..	1	0	28
	INDIANA																																										
29	Indiana Univ., School of Med.—R	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	29
	IOWA																																										
30	Drake University, College of Med.—R	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30
31	State University of Iowa, College of Med.—R	..	..	..	..	..	..	3	0	..	..	..	..	1	0	..	..	..	..	..	..	2	1	..	..	..	..	35	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31
32	State University of Iowa, Homeo. Dept.—H	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32
	KANSAS																																										
33	Kansas Medical College.—R	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	10	0	..	..	..	..	..	..	..	..	1	0	..	..	33
34	Univ. of Kansas, School of Med.—R	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	10	1	..	..	..	..	..	..	..	..	..	..	..	..	34
	KENTUCKY																																										
35	Univ. of Louisville, Med. Dept.—R	0	1	1	0	2	0	0	1	..	..	..	..	..	..	..	..	4	0	2	1	1	0	1	2	13	2	2	0	..	..	39	4	3	4	0	1	..	..	..	..	1	0	35
	LOUISIANA																																										
36	Tulane University, Med. Dept.—R	10	6	1	0	..	..	1	0	..	..	..	..	..	..	..	..	5	0	1	0	1	0	1	0	..	..	..	..	1	0	..	..	89	6	..	..	..	..	..	..	..	..	36
	MAINE																																										
37	Medical School of Maine.—R	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	0	..	..	5	1	..	..	37
	MARYLAND																																										
38	Baltimore Medical College.—R	..	..	..	..	..	..	1	0	..	..	2	2	1	0	0	1	3	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	16	2	2	0	1	0	38
39	College of Physicians and Surgeons.—R	..	..	1	0	..	..	0	2	..	..	4	1	..	..	..	..	4	0	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	14	3	5	1	..	..	39
40	Johns Hopkins Univ., Med. Dept.—R	3	0	2	0	..	..	2	0	..	..	4	0	..	..	1	0	..	..	1	0	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	47	1	6	0	..	..	40
41	Maryland Medical College.—R	..	..	..	..	..	..	..	..	..	..	2	2	1	0	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	5	12	23	5	4	..	..	41
42	Univ. of Maryland, School of Med.—R	2	0	..	..	..	..	1	0	..	..	3	1	..	..	3	0	5	0	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37	6	2	0	..	..	42
	MASSACHUSETTS																																										
43	Boston University, School of Med.—H	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	..	..	16	1	..	..	43
44	College of Physicians and Surgeons.—R	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	2	1	1	1	..	..	1	0	..	..	..	..	..	..	..	..	..	..	13	2	..	..	10	6	..	..	44
45	Harvard Medical School.—R	0	1	..	..	..	..	6	1	1	0	2	0	..	..	1	0	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	3	0	..	..	31	2	1	0	45
46	Tufts College Medical School.—R	..	..	..	..	..	..	1	0	..	..	2	0	..	..	..	..	..	..	2	1	..	..	1	1	..	..	..	..	1	1	..	..	..	..	15	4	..	..	67	2	..	..	46
	MICHIGAN																																										
47	Detroit College of Medicine.—R	..	..	1	0	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	38	0	47
48	Univ. of Mich., Dept. of Med. and Surg.—R	..	..	..	..	..	..	5	0	..	..	1	0	..	..	..	..	3	0	..	..	1	0	3	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	77	0	48
49	Univ. of Mich., Homeo. College.—H	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	16	0	49
	MINNESOTA																																										
50	Univ. of Minn., College of Med. and Surg.—R	..	..	1	1	..	..	7	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50
	MISSOURI																																										
51	American Medical College.—E	..	..	..	..	4	1	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51
52	Barnes Medical College.—R	..	..	1	0	3	1	0	2	..	..	..	..	..	..	..	..	1	2	..	..	1	1	1	4	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52
53	Eclectic Medical University, Kansas City.—E	..	..	..	..	13	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	53
54	Ensworth Medical College.—R	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	54
55	Kansas City Hahnemann Med. College.—H	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	2	..	..	..	..	..	..	..	..	..	..	..	..	55
56	St. Louis University, School of Medicine.—R	..	..	..	..	2	0	3	0	1	0	1	0	..	..	..	..	..	..	1	0	..	..	8	2	1	0	3	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	56
57	St. Louis College of Phys. and Surgs.—R	..	..	..	..	1	1	1	0	..	..	..	..	..	..	..	..	0	2	1	0	1	1	0	3	..	..	1	2	0	2	..	..	0	1	..	..	..	..	..	..	..	..	57
58	University Medical College, Kansas City.—R	..	..	..	..	1	0	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	7	2	..	..	..	..	..	..	..	..	1	0	..	..	58
59	Washington University, Med. Dept.—R	..	..	1	0	1	0	4	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	59
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		

R—Regular; H—Homeopathic; E—Eclectic

Marginal Number	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	Totals:	Examined—Passed	Examined—Failed	Percentage of Failures	No. States Ex. In	Marginal Number
	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming						
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
1																				22 0	1 0								49	27	22	44.9	5	1
2		3 0	1 0																	0 1									49	37	12	24.5	6	2
3														1 3	2 3					1 0									7	3	4	57.1	3	3
4			1 1											3 2	2 2														59	46	13	22.0	5	4
5	1 0														1 0					1 0	1 0									32	29	3	9.4	6	5
6						1 0									1 1														10	5	5	50.0	4	6
7															1 0														34	31	3	8.8	2	7
8																													4	3	1	25.0	1	8
9																													7	6	1	14.3	1	9
10										1 0					1 0														35	35	0	0.	3	10
11										0 1				1 0	1 1							2 0			3 0			1 0	47	44	3	6.4	10	11
12										5 1			1 0										1 0						30	28	2	6.7	6	12
13				0 1	1 0					0 2	1 1				1 1		1 0	2 0		1 0	2 0	1 0							47	40	7	14.9	16	13
14								1 0		1 0							1 1							1 0					26	21	5	19.2	9	14
15			1 0					1 0		1 1	1 1			2 2				1 0						6 0		7 2			48	35	13	27.1	16	15
16									0 1		1 0			1 0				4 1			1 0								79	73	6	7.6	8	16
17		2 1									1 0			1 1				1 1											65	55	10	15.4	9	17
18																		0 2						0 1					4	1	3	75.0	3	18
19																		0 1											5	3	2	40.0	2	19
20																		2 2											41	35	6	14.6	4	20
21			1 0	3 0	5 0															1 0					0 1	1 0	4 7		98	75	23	23.5	16	21
22		1 0	2 0	2 0	3 0					0 2		0 1		4 0	1 1						1 0				1 2	2 0	1 0	1 0	166	134	32	19.3	24	22
23	1 0	1 0		1 1	1 0					0 1				1 0	6 3				2 0				0 1	7 2		1 0		215	175	38	17.8	19	23
24				2 0	2 0	1 0									3 1					1 0	1 0	0 1			1 1		0 1		63	44	19	30.1	19	24
25															0 1										1 0				9	6	3	33.3	6	25
26																			1 0										14	11	3	21.4	3	26
27	1 0		3 0	2 0	2 0					1 0		1 0		2 0	3 0				3 0	1 0		3 0			4 0		6 0		139	131	8	5.8	22	27
28	4 0		3 0	5 0	3 0					2 1			3 0	1 1	12 0					1 0		5 0			4 0		3 0	2 0	166	158	8	4.8	25	28
29															1 0				1 0									0 1	50	49	1	2.0	5	29
30				1 0										1 0					1 0										21	21	0	0.	6	30
31				0 1		1 0									1 1										1 0				49	44	5	10.2	8	31
32					1 0																								5	5	0	0.	2	32
33				1 0																					1 0				15	15	0	0.	5	33
34			2 0												1 0														15	13	2	13.3	4	34
35	0 1	5 0	4 1	0 1	1 0			1 1		0 3	2 0	1 0	1 0	4 0	2 2			1 0	1 0	13 1	4 1			2 0	3 2	10 4	0 1		188	154	34	18.1	34	35
36		8 1								1 1	2 0			2 0				1 0			15 0			1 0					154	140	14	9.1	16	36
37							3 1			1 0																			18	16	2	11.1	4	37
38				2 1			2 2			2 4							3 1					1 1	3 0	0 1	2 0			59	44	15	25.4	18	38
39	1 0						1 0	1 1		4 3	0 1				1 0		2 0	0 1		2 0	1 0			1 0	15 4				75	58	17	22.7	19	39
40	2 0		2 0				1 0			7 4	1 0							1 0		2 0			2 0	3 0		1 0			95	90	5	5.3	19	40
41		0 1					0 2				1 0												3 3		6 5		1 0		81	35	46	56.8	12	41
42		1 0					1 0	2 2		2 2	10 2				1 0			8 0		1 0		1 0	2 0		2 0				99	86	13	13.1	19	42
43							5 0			1 0							3 0												30	29	1	3.3	6	43
44	1 0										0 1						6 2	2 0		1 0									43	31	12	28.0	10	44
45			1 0		1 0		3 0	0 1		11 2			0 1		4 0		9 4	1 0				1 0					1 0		85	75	10	11.8	20	45
46				1 0			6 0			3 0																			119	107	12	10.1	11	46
47				1 0											1 0														44	43	1	2.3	6	47
48	1 0			6 0	1 0					2 0					1 0			1 0						1 2				107	103	2	1.9	16	48
49													1 0												1 0				19	19	0	0.	3	49
50	29 0			3 0							4 0				1 0									5 1					52	50	2	3.8	7	50
51			23 8											2 0	1 0				1 0	2 0					1 0				61	43	18	29.5	8	51
52	1 0	0 1	7 4								0 1			0 1	0 1				1 0	2 0				0 1					39	20	19	48.7	16	52
53																													13	13	0	0.	1	53
54			3 2		1 3						0 1				0 1					1 0									13	5	8	61.5	6	54
55			3 0		0 1									0 1															15	10	5	33.3	5	55
56			55 0		1 0					1 0				4 0	3 1						1 0	1 0		2 0					91	88	3	3.3	16	56
57	0 1		2 4	1 0	0 1				2 0					4 2							1 0			0 1			1 0		37	16	21	56.7	18	57
58			19 5	2 0	2 0									2 0	1 0														46	39	7	15.2	12	58
59			44 0									1 0		1 0	2 0									2 1		1 0	1 0		67	65	2	3.0	12	59
	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49						

Marginal Number	NAME OF COLLEGE	1 Alabama		2 Arizona		3 Arkansas		4 California		5 Colorado		6 Connecticut		7 Delaware		8 District of Columbia		9 Florida		10 Georgia		11 Idaho		12 Illinois		13 Indiana		14 Iowa		15 Kansas		16 Kentucky		17 Louisiana		18 Maine		19 Maryland		20 Massachusetts		21 Michigan		Marginal Number
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
	NEBRASKA																																								
60	John A. Creighton Medical College.—R							3	0													1	0																		60
61	Lincoln Medical College.—E							0	1																																61
62	University of Nebraska, College of Med.—R			0	1			1	0									1	0									1	0												62
	NEW HAMPSHIRE																																							
63	Dartmouth Medical School.—R																	1	0																	6	1				63
	NEW YORK																																							
64	Albany Medical College.—R							2	0																	1	0									2	0				64
65	Columbia University, Coll. of P. and S.—R	1	0	1	0			5	0			4	1					1	0			0	1	1	0									2	0				65
66	Cornell University Medical College.—R							2	0			1	0											1	0			1	0							1	0				66
67	Eclectic Med. Coll. of City of New York.—E											1	0																							0	1				67
68	Fordham University, School of Medicine.—R																																								68
69	Long Island College Hospital.—R											0	1											1	0											1	0				69
70	New York Homeo. Med. Coll. and Hosp.—H							1	0			2	0	2	0																			2	0	2	0				70
71	New York Med. Coll. and Hosp. for Women.—H																																								71
72	Syracuse University, College of Medicine.—R							1	0															2	0																72
73	Univ. and Bellevue Hosp. and Med. Coll.—R	1	0					1	0			1	0																							1	0	1	0		73
74	Univ. of Buffalo, Med. Dept.—R																	1	1			2	0	1	0											1	0				74
	NORTH CAROLINA																																							
75	Leonard School of Medicine.—R	1	2															4	2	1	0																				75
76	North Carolina Medical College.—R																	1	0	1	0																				76
	OHIO																																							
77	Cleveland College of Phys. and Surg.—R							1	0																																77
78	Cleveland-Pulte Medical College.—H																																								78
79	Eclectic Medical College.—E																																								79
80	Ohio-Miami Medical College.—R	1	0					6	0	1	0											1	0	1	0	3	0			1	0	3	0			1	0				80
81	Starling-Ohio Medical College.—R																	0	1			1	0															1	0		81
82	Toledo Medical College.—R																																								82
83	Western Reserve University, Med. Dept.—R							1	0																																83
	OKLAHOMA																																							
84	University of Oklahoma, School of Medicine.—R					1	0																																		84
	OREGON																																							
85	Willamette University, Med. Dept.—R							0	1																																85
86	University of Oregon, Med. Dept.—R							1	1													0	1																		86
	PENNSYLVANIA																																							
87	Hahnemann Med. College and Hospital.—H					1	0	1	0			1	0	1	0									1	0											3	0	1	0		87
88	Jefferson Medical College.—R	3	1			3	0	2	0			0	1	7	0	1	0	2	2	2	0	2	0	1	0	3	0	9	0	1	0					5	0	4	1	6	0			88
89	Medico-Chirurgical College of Philadelphia.—R							2	1	1	0	2	0	2	0					1	0	1	0			1	0			1	0					1	1	8	2	1	0			89
90	Temple University, Med. Dept.—R											1	0																												90
91	Univ. of Pennsylvania, Dept. of Med.—R	0	1	1	0	2	0	7	2			3	0	3	0					1	0	1	0	1	0					1	0	1	0			4	0	5	0	5	0			91
92	Univ. of Pittsburgh, School of Medicine.—R													1	0			1	0																						92
93	Woman's Med. Coll. of Pennsylvania.—R	1	0					1	0			2	1	1	0	1	1							1	0	2	0	2	0	1	0			1	0	2	0	2	1			1	0	93
	SOUTH CAROLINA																																								
94	Med. Coll. of the State of South Carolina.—R																	5	1	6	0																	1	0		94
	TENNESSEE																																								
95	Memphis Hospital Medical College.—R	2	7			16	3											3	1	1	0							2	0	0	1			12	15						95
96	Meharry Medical College.—R	1	6			7	4											2	0	8	8																				96
97	Lincoln Memorial Univ., Med. Dept.—R			0	1			0	1									1	0			0	1									1	0	4	0			0	1		97
98	Univ. of Tennessee, Medical Dept.—R	3	2			1	1											4	1	0	1									0	2	1	0	0	2			1	0		98
99	Univ. of West Tennessee, Med. Dept.—R																	1	3																						99
100	Vanderbilt University, Med. Dept.—R	2	2			5	1	4	0			1	0					5	1	1	0			1	0							3	0	3	0						100
	TEXAS																																								
101	Baylor University, College of Medicine.—R																																								101
102	Texas Christian University, Med. Dept.—R																																	0	1						102
103	Southern Methodist University Med. Dept.—R																																								103
104	University of Texas, Dept. of Med.—R																																	1	0						104
	VERMONT																																								
105	Univ. of Vermont, College of Med.—R											4	1									1	0													2	0			8	3		105
	VIRGINIA																																								
106	Medical College of Virginia.—R																																								106
107	Univ. of Virginia, Dept. of Med.—R	1	1	2	0			2	0					1	0			2	0																			1	0		107
108	University College of Medicine.—R	1	0									1	0					1	0															2	0			1	0		108
	WISCONSIN																																								
109	Marquette University, Med. Dept.—R							1	0															3	2			3	1									1	0		109
110	Wisconsin Coll. of Phys. and Surgs.—R							1	0																																110
	CANADIAN																																								
111	Dalhousie Med. College																																					1	0		111
112	Laval University, Med. Dept											0	1																							2	2			2	4	1	1	112
113	Manitoba Medical College																																								113
114	McGill University, Medical Faculty											3	0																												114
115	Queens University, Medical Faculty											0	1																							3	0			3	0		115
116	University of Toronto, Faculty of Medicine			1	0			1	0									1	0					0	1											1	0			1	0		116
117	Western University, Med. Dept																							2	0			1	0												117
118	Foreign Colleges			1	0			9	1	1	0			1	1	1	0	1	0	1	0			3	3	1	0									1	0	6	4	2	1	118
119	Miscellaneous Medical Colleges	4	5	8	7	5	2	26	19	1	0	0	2			1	1	14	5	2	2	4	2	19	18	3	2	4	1	1	0	6	3	3	2	1	0	1	1	3	4	7	1	119
120	Undergraduates									1	0																									1	2			13	16			120
	Totals by States	156		4		151		316		42		88		23		56		145		196		47		639		99		138		62		96		164		91		206		281		102		
	Totals—Examined—Passed	84		3		124		256		41		70		22		49		114		178		35		505		95		131		50		88		128		74		160		227		139		
	Totals—Examined—Failed	72		1		27		60		1		18		1		7		31		17		12		134		4		7		12		8		36		17		46		54		2		
	Percentage of Failures	46.2		23.		17.9		19.0		2.4		20.5		4.4		12.5		21.4		8.7		25.5		21.0		4.0		5.1		19.4		8.3		22.0		18.7		22.3		19.2		1.9		
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		

R—Regular; H—Homeopathic; E—Eclectic.

Marginal Number	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	Totals:	Examined—Passed	Examined—Failed	Percentage of Failures	No. States Ex. in	Marginal Number
	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming						
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
80			1 0	2 0	41 4										0 1				1 0										55	50	5	9.1	8	80
81					9 1															1 0									12	10	2	16.7	3	81
82					9 0																							1 0	14	13	1	7.2	6	82
83							3 1			1 0							2 0						2 0						17	15	2	11.8	6	83
84			1 0	2 0			1 0	3 0		30 28					3 0								1 0		2 0				56	36	20	35.7	5	84
85	1 0							4 0		65 8															1 0				105	95	10	9.5	17	85
86								1 1		23 0																			34	34	0	0.	8	86
87										7 6																			17	9	8	47.1	4	87
88										11 7											1 0								19	12	7	36.8	2	88
89			1 0				1 0	5 0		63 17	1 0			1 0							1 0								95	75	18	19.4	10	89
90								4 0		13 5		2 0																	33	28	5	15.2	8	90
91										3 2																			5	3	2	40.0	1	91
92					1 0					20 5					1 0														30	25	5	16.7	5	92
93								7 0		70 7							1 0												90	83	7	7.8	8	93
94										31 10															2 1				50	38	12	24.0	6	94
95		0 1									8 12							2 3						7 10		1 2			56	24	32	57.1	8	95
96											20 6							0 1											29	22	7	24.1	4	96
97										1 0			18 0																20	20	0	0.	3	97
98													10 3																13	10	3	23.1	1	98
99													6 2		0 1					2 6					0 1	0 2			28	22	6	21.4	10	99
100										0 1			47 2												2 0	1 0			60	56	4	6.7	10	100
101													14 1		2 0														58	57	1	1.7	3	101
102													9 1																10	9	1	10.0	1	102
103										1 0			14 0							2 0									38	38	0	0.	4	103
104														9 1	0 1														12	10	2	16.7	3	104
105															1 9										1 0				12	2	10	83.3	3	105
106															8 8										5 1				25	14	11	44.0	4	106
107	2 0							2 0		5 1			1 0						1 0		1 0								22	21	1	4.5	13	107
108			5 0	1 0		3 0	1 0	10 0		2 2	13 0		3 0	4 0	2 0		3 1	2 0	2 0			2 0							124	115	9	7.3	34	108
109			1 0					6 0		1 1			1 0				1 1					1 0	2 0						40	34	6	15.0	18	109
110																													4	4	0	0.	2	110
111	2 0		2 0	1 0				8 0		8 4			4 0		1 0		1 0		1 0	1 0	2 0	1 0		3 0			2 0		79	72	7	8.9	28	111
112				1 0						0 1			1 0		1 0										4 0	1 0	0 1		12	10	2	16.7	9	112
113	1 1						1 0	1 0		5 4	1 0										1 0				1 0		1 0		38	30	8	21.1	21	113
114																																		
115		0 1								1 0							58 13												86	71	15	17.4	6	114
116																																		
117																																		
118		21 18							1 0					6 3				0 2		37 2	2 4			1 0					163	104	59	36.2	14	118
119		0 4	3 4								0 2			8 7				0 3		32 6	8 3			4 1		1 0			132	81	51	38.6	18	119
120									2 0		1 2		1 0		0 1			0 1		11 2				2 0	1 0				29	19	10	34.5	13	120
121		2 2									0 1			1 0				0 1		21 2	1 0			0 1		1 0			51	36	15	29.4	15	121
122														4 2				0 1		4 2				0 2					20	9	11	55.0	6	122
123		1 0	2 0	0 1						1 0	1 0			4 0				2 0		15 0	4 0				1 0				61	56	5	8.2	19	123
124																																		
125																				15 2									17	15	2	11.8	1	125
126														2 0						14 1									18	16	2	11.1	3	126
127														1 0						12 1									14	13	1	7.2	2	127
128																				48 0									49	49	0	0.	2	128
129				1 0			3 0			1 1							2 1					33 1							63	56	7	11.1	9	129
130																																		
131		2 0								1 1	4 2							1 0			1 0			34 6		1 0			50	41	9	18.0	5	131
132										1 1	3 0			1 0	1 1									8 0		1 0			32	29	3	9.4	15	132
133										1 0	11 1													21 1		2 0			42	39	3	7.1	9	133
134			0 1	3 1								1 0		1 0					4 0						1 0		32 6	1 0	61	50	11	18.0	11	134
135			1 0											1 0													10 1		14	13	1	7.2	4	135
136																																		
137																																		
138						1 0	1 0			0 1							2 1												1	1	0	0.	1	138
139										1 0		1 0					2 0				1 0				1 0				19	9	10	52.6	8	139
140	1 0									1 0		1 0																	3	3	0	0.	3	140
141	2 0						1 0			3 1		1 0					2 0				1 0				1 0				21	20	1	4.8	10	141
142										3 2					1 0							0 1				1 0			12	7	5	41.7	8	142
143	1 0									5 1		0 1	1 0							1 0						1 0			17	15	2	11.8	11	143
144																													1	1	0	0.	1	144
145	0 1	3 1	1 0	2 1		1 0	2 1	1 5		8 12		2 3	1 1		2 1					1 0	2 0	1 0		3 3	0 3		2 0		88	53	35	39.8	25	145
146	10 18	15 1	5 2	3 0	0 1	2 0	0 3	1 1		2 4	3 5	2 3	2 1	14 2	14 9		0 2	1 1	15 8	5 1	2 0		3 3	6 6	1 1	1 1	1 1	1 0	375	224	151	40.3	45	146
147															8 18				142 52										253	165	88	35.0	5	147
148	0	104	245	59	98	9	43	73	8	586	124	22	211	121	161	.....	51	125	17	389	164	22	47	135	96	86	87	11	6353	.....	.....	.....	.....	148
149	56	56	213	50	88	8	30	56	6	433	87	15	199	94	96	.....	39	90	16	312	151	20	45	105	62	66	68	11	.....	5110	.....	.....	.....	149
150	5	48	32	9	10	1		14	2	153	37	7	12	27	65	.....	12	35	1	76	13	2	5	38	27	20	19	0	.....	.....	1243	.....	.....	150
151	8.9	46.2	13.1	15.3	10.2	11.1	16.	19.2	25.0	26.1	29.8	31.8	5.7	22.3	40.4	.....	23.5	28.0	5.9	19.5	7.9	9.1	4.3	22.7	28.	23.3	21.8	0.	.....	.....	.....	17.8	.....	151
	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	.....	.....	.....	.....	.....	

Marginal Number	NAME OF COLLEGE	1 Alabama P	1 Alabama F	2 Arizona P	2 Arizona F	3 Arkansas P	3 Arkansas F	4 California P	4 California F	5 Colorado. P	5 Colorado. F	6 Connecticut P	6 Connecticut F	7 Delaware P	7 Delaware F	8 District of Columbia P	8 District of Columbia F	9 Florida P	9 Florida F	10 Georgia P	10 Georgia F	11 Idaho P	11 Idaho F	12 Illinois P	12 Illinois F	13 Indiana P	13 Indiana F	14 Iowa P	14 Iowa F	15 Kansas P	15 Kansas F	16 Kentucky P	16 Kentucky F	17 Louisiana P	17 Louisiana F	18 Maine P	18 Maine F	19 Maryland P	19 Maryland F	20 Massachusetts P	20 Massachusetts F	21 Michigan P	21 Michigan F	Marginal Number
	ALABAMA																																											
1	Birmingham Medical College.—R	20	22															1	0	3	0																								1
2	University of Alabama, Medical Dept.—R	21	9															4	2															8	0										2
	ARKANSAS																																											
3	College of Physicians and Surgeons.—R					1	2																																					3
4	University of Arkansas, Medical Dept.—R					38	9											1	0															0	1										4
	CALIFORNIA																																											
5	College of P. and S., Los Angeles.—R			1	0			24	3																																		5
6	College of P. and S., San Francisco.—R							2	4																																		6
7	Cooper Medical College.—R							30	2																																		7
8	Hahnemann Medical College of the Pacific.—H							3	1																																		8
9	Oakland College of Medicine and Surgery.—R							6	1																																		9
10	University of California, Medical Dept.—R							33	0																																		10
	COLORADO																																										
11	University of Colorado, Medical Dept.—R							3	0	30	0											1	0							1	0												11
	CONNECTICUT																																										
12	Yale Medical College.—R											17	1																							1	0			2	0			12
	DISTRICT OF COLUMBIA																																										
13	George Washington University.—R							1	0							21	2			1	0			2	0			1	0									2	1		1	0	13
14	Georgetown University, School of Medicine.—R											2	0			13	2																					1	1				14
15	Howard University, Medical Dept.—R	0	1													5	0	4	0	3	1																	1	3	1	0		15
	GEORGIA																																										
16	Atlanta College of Physicians and Surgeons.—R	1	2															12	1	53	1																						16
17	Atlanta School of Medicine.—R	1	2															4	1	45	1																						17
18	Georgia College of Eclectic Med. and Surg.—E																																										18
19	Southern College of Med. and Surg., Atlanta.—R																	3	1																								19
20	Medical College of Georgia.—R	0	1															2	3	31	0																						20
	ILLINOIS																																										
21	Bennett Medical College.—R	1	0					1	0									1	0					49	14	1	0	2	0									1	0	2	0		21
22	Chicago College of Medicine and Surgery.—R			1	0	3	1	1	0	2	0							1	0			1	1	95	23	4	0	5	0	1	0							1	0				22
23	College of Physicians and Surgeons.—R							6	1													2	0	111	25	3	0	13	1	1	0									8	0		23
24	Hahnemann Medical College and Hospital.—R					2	0					1	0			1	0							17	11	3	0	4	1														24
25	Hering Medical College.—H							1	0											1	0			2	2							1	0										25
26	Jenner Medical College.—R					1	0																	8	2																		26
27	Northwestern University Medical School.—R	2	0					5	1	1	0											5	1	66	6	4	0	10	0														27
28	Rush Medical College.—R	1	0	4	0			6	0	1	0							2	0					72	2	1	0	5	0	4	0									1	0		28
	INDIANA																																										
29	Indiana University, School of Medicine.—R							1	0																	46	0																29
	IOWA																																										
30	Drake University, College of Medicine.—R																											16	0														30
31	State Univ. of Iowa, College of Medicine.—R							1	0					1	0													34	0														31
32	State Univ. of Iowa, Homeo. Dept.—H																											4	0														32
	KANSAS																																										
33	Kansas Medical College.—R																													10	0												33
34	University of Kansas, School of Medicine.—R																					0	1							10	1												34
	KENTUCKY																																										
35	University of Louisville, Medical Dept.—R	0	1			2	0											4	0	2	1			1	2	13	2	2	0			68	4	3	4	0	1			1	0		35
	LOUISIANA																																										
36	Tulane University, Medical Dept.—R	9	6															5	0	1	0									1	0			89	4								36
	MAINE																																			7	0			4	0			
37	Medical School of Maine.—R																																										37
	MARYLAND																																										
38	Baltimore Medical College.—R											2	2					2	0																	1	0	16	2	1	0	1	0	38
39	College of Physicians and Surgeons.—R											4	1					3	0	1	0											1	0					14	3	4	1			39
40	Johns Hopkins University, Medical Dept.—R	3	0					1	0			3	0			1	0							1	0													46	1	6	0			40
41	Maryland Medical College.—R											2	2	1	0					2	1															2	5	11	22	5	4			41
42	University of Maryland, School of Medicine.—R	1	0					1	0			3	1			2	0	3	0	2	0																	36	6	2	0			42
	MASSACHUSETTS																																										
43	Boston University, School of Medicine.—H											1	0																							2	0			16	1			43
44	College of Physicians and Surgeons.—R											0	1					1	1	1	1			1	0											13	2			10	5			44
45	Harvard Medical School.—R	0	1					6	1	1	0	2	0											1	0	1	0									2	0			29	2	1	0	45
46	Tufts College Medical School.—R											2	0																							14	3			67	2			46
	MICHIGAN																																										
47	Detroit College of Medicine.—R																									1	0																	47
48	Univ. of Mich., Dept. of Med. and Surg.—R							2	0									1	0			1	0	2	0	1	0													38	0	48	
49	Univ. of Mich., Homeo. College.—H																																							76	0	49	
	MINNESOTA																																							16	0		
50	Univ. of Minn., College of Med. and Surg.—R							3	0																																	50
	MISSOURI																																										
51	American Medical College.—E					3	1																	9	8																	51
52	Barnes Medical College.—R					3	1	0	1									1	0			1	0	1	2			2	0													52
53	Eclectic Medical University, Kansas City.—E					13	0																																			53
54	Ensworth Medical College.—R																													0	1											54
55	Kansas City Hahnemann Medical College.—H					1	1																							6	2											55
56	St. Louis University, School of Medicine.—R					2	0	2	0			1	0							1	0			8	2	1	0	3	0													56
57	St. Louis College of Phys. and Surg.—R					0	1											0	1					0	3			1	2	0	2											57
58	University Medical College, Kansas City.—R																							1	0			1	0	7	2											58
59	Washington University, Medical Dept.—R			1	0	1	0	2	0															6	0			1	0													59
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		

R—Regular; H—Homeopathic; E—Eclectic.

Marginal Number	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Totals:	Examined—Passed	Examined—Failed	Percentage of Failures	No. States Ex. In	Marginal Number
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F					
1																				2 0									48	26	22	45.8	4	1
2		3 0	1 0																										48	37	11	22.9	5	2
3														1 2						1 0									7	3	4	57.1	3	3
4			1 1											3 2															56	43	13	23.2	5	4
5	1 0														1 0					1 0	1 0								32	29	3	9.4	6	5
6						1 0									1 1														9	4	5	55.6	3	6
7															1 0														33	31	2	6.1	2	7
8																													4	3	1	25.0	1	8
9																													7	6	1	14.3	1	9
10															1 0														34	34	0	0.	2	10
11										0 1				1 0	1 0						2 0			3 0			1 0		44	43	1	2.3	10	11
12										5 1			1 0																28	26	2	7.1	5	12
13										0 2	1 1				1 0			2 0					1 0	2 0	1 0				44	37	7	15.9	14	13
14								1 0		1 0							1 1							1 0					24	20	4	16.7	7	14
15			1 0					1 0		1 1	1 1							1 0						6 0		7 2			41	32	9	22.0	13	15
16											1 0			1 0				4 1			1 0								78	73	5	6.4	7	16
17		2 1									1 0			1 1				1 1											65	55	10	15.4	9	17
18																		0 2						0 1					3	0	3	100.0	2	18
19																		0 1											5	3	2	40.0	2	19
20																		2 2											41	35	6	14.6	4	20
21				1 0	2 0	5 0														1 0					0 1	1 0	4 7		93	71	22	23.7	14	21
22		1 0	2 0	2 0	1 0	1 0				0 2		0 1		4 0							1 0				1 2	2 0	1 0	1 0	161	131	30	18.6	23	22
23	1 0			1 1	1 0					0 1				1 0	4 2				2 0					0 1	6 1		1 0		194	161	33	17.0	17	23
24				1 0	2 0										1 0					1 0							0 1		47	34	13	27.7	12	24
25															0 1										1 0				9	6	3	33.3	6	25
26																		1 0											12	10	2	16.7	3	26
27	1 0		3 0	1 0	2 0					1 0		1 0		1 0	2 0			3 0		1 0		3 0			4 0		6 0		130	122	8	6.2	20	27
28	4 0		3 0	3 0	3 0					1 1			3 0		9 0					1 0		5 0			2 0		3 0		137	134	3	2.2	21	28
29															1 0				1 0								0 1		50	49	1	2.0	5	29
30				1 0										1 0					1 0										19	19	0	0.	4	30
31															1 1										1 0				39	38	1	2.6	5	31
32																													4	4	0	0.	1	32
33				1 0																					1 0				12	12	0	0.	3	33
34			2 0												1 0														15	13	2	13.3	4	34
35	0 1	5 0	3 1	0 1	1 0			1 1		0 2	2 0	1 0	1 0	2 0	1 1			1 0	1 0	13 1	4 1			2 0	2 2	10 4	0 1		177	146	31	17.5	31	35
36		8 1								1 1	2 0			2 0				1 0			15 0			1 0					147	135	12	8.2	12	36
37							3 0			1 0																			15	15	0	0.	4	37
38							2 1			2 1							3 0						1 1	2 0	0 1	1 0			42	34	8	19.0	13	38
39								1 1		3 3	0 1						2 0	0 1			1 0				1 0	15 4			63	50	15	23.1	14	39
40	2 0		2 0				1 0			7 4	1 0													2 0	3 0				86	81	5	5.8	15	40
41		0 1					0 2			1 0														3 3		5 5		1 0	78	33	45	57.7	12	41
42								1 1		1 1	9 2							8 0			1 0		1 0	2 0		1 0			85	74	11	12.9	10	42
43							3 0			1 0							2 0												26	25	1	3.8	6	43
44	1 0									0 2	0 1						5 1	2 0			1 0								41	30	11	26.9	10	44
45					1 0		1 0	0 1		2 0			0 1		3 0		5 1						1 0					1 0	78	64	9	12.3	18	45
46							5 0			2 0							8 3	1 0											107	99	8	7.5	7	46
47																													39	39	0	0.	2	47
48				5 0	1 0					2 0								1 0						1 0					93	93	0	0.	11	48
49													1 0											1 0					19	19	0	0.	4	49
50	2 0			2 0								3 0												2 0					39	39	0	0.	5	50
51			2 3	8										2 0						2 0						1 0			57	40	17	29.8	6	51
52			2 2																	1 0									18	11	7	38.9	8	52
53																													13	13	0	0.	1	53
54			3 2		1 3							0 1								1 0									12	5	7	58.3	5	54
55			2 0		0 1									0 1															14	9	5	35.7	5	55
56			55 0		1 0					1 0				4 0	3 0						1 0	1 0			2 0				88	86	2	2.3	15	56
57	0 1		2 3	1 0	0 1			2 0						4 2							1 0								27	11	16	59.2	12	57
58			18 5	2 0	2 0									1 0															39	32	7	18.0	7	58
59			39 0											1 0	2 0										1 1		1 0	1 0	57	56	1	1.8	11	59
	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49					

Marginal Number	NAME OF COLLEGE	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		Marginal Number
		Alabama		Arizona		Arkansas		California		Colorado		Connecticut		Delaware		District of Columbia		Florida		Georgia		Idaho		Illinois		Indiana		Iowa		Kansas		Kentucky		Louisiana		Maine		Maryland		Massachusetts		Michigan		
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
	NEBRASKA																																									
60	John A. Creighton Medical College.—R							2	0													1	0																				60
61	Lincoln Medical College.—E																																									61
62	University of Nebraska, College of Med.—R			0	1																							1	0													62
	NEW HAMPSHIRE																																									
63	Dartmouth Medical School.—R																	1	0																			6	1			63
	NEW YORK																																									
64	Albany Medical College.—R							1	0																	1	0											2	0			64
65	Columbia University, Coll. of P. and S.—R	1	0					2	0			1	0									0	1	1	0											1	0					65
66	Cornell University Medical College.—R							1	0			1	0											1	0			1	0									1	0			66
67	Eclectic Med. Coll. of City of New York.—E											1	0																									0	1			67
68	Fordham University, School of Medicine.—R																																									68
69	Long Island College Hospital.—R																																					1	0			69
70	New York Homeo. Med. Coll. and Hosp.—H											1	0	2	0																			2	0			1	0			70
71	New York Med. Coll. and Hosp. for Women.—H																																									71
72	Syracuse University, College of Medicine.—R																																								72
73	University and Bellevue Hosp. Med. Coll.—R	1	0					1	0			1	0																									1	0			73
74	Univ. of Buffalo, Med. Dept.—R																					1	0	1	0																	74
	NORTH CAROLINA																																									
75	Leonard School of Medicine.—R	1	1															4	2	1	0																				75
76	North Carolina Medical College.—R																			1	0																				76
	OHIO																																								
77	Cleveland College of Phys. and Surg.—R							1	0																																77
78	Cleveland-Pulte Medical College.—H																																								78
79	Eclectic Medical College.—E					4	0																	1	0	3	0					2	0								79
80	Ohio-Miami Medical College.—R	1	0															0	1			1	0							1	0	2	0			1	0				80
81	Starling-Ohio Medical College.—R																																						1	0	81
82	Toledo Medical College.—R																																								82
83	Western Reserve University, Med. Dept.—R																																								83
	OKLAHOMA																																								
84	University of Oklahoma, School of Medicine.—R					1	0																																	84	84
	OREGON																																									
85	Willamette University, Med. Dept.—R																																								85
86	University of Oregon, Med. Dept.—R							1	0																																86
	PENNSYLVANIA																																								
87	Hahnemann Med. College and Hospital.—H											1	0	1	0																					2	0	1	0			87
88	Jefferson Medical College.—R	2	1			1	0					0	1	6	0	1	0	1	1	1	0	2	0	1	0	3	0	9	0	1	0					5	0	4	0	4	0			88
89	Medico-Chirurgical College of Phila.—R									1	0	1	0	2	0							1	0			1	0									1	1	3	2	1	0			89
90	Temple University, Med. Dept.—R											1	0																									3	0					90
91	Univ. of Pennsylvania, Dept. of Med.—R	0	1	1	0	2	0	1	0			3	0	2	0					1	0									1	0	1	0			4	0	5	0	4	0			91
92	Univ. of Pittsburgh, School of Medicine.—R													1	0			1	0																					1	0	92
93	Woman's Med. Coll. of Pennsylvania.—R											2	1	1	0									1	0	1	0	2	0	1	0			1	0	2	0	2	1			93
	SOUTH CAROLINA																																								
94	Med. Coll. of the State of South Carolina.—R																	4	1	3	0																	1	0			94
	TENNESSEE																																								
95	Memphis Hospital Medical College.—R	2	7			14	3											2	1									2	0	0	1			11	17							95
96	Meharry Medical College.—R	1	6			6	3											2	0	8	8			0	1	2	0					1	0	4	0			0	1			96
97	Lincoln Memorial Univ., Med. Dept.—R							0	1									1	0													0	1									97
98	Univ. of Tennessee, Medical Dept.—R	3	2			1	1											4	1	0	1													0	2			1	0			98
99	Univ. of West Tennessee, Med. Dept.—R																	1	3																							99
100	Vanderbilt University, Med. Dept.—R	2	2			4	1	2	0									4	0	1	0			1	0							3	0	3	0							100
	TEXAS																																								
101	Baylor University, College of Medicine.—R																																									101
102	Texas Christian University, Med. Dept.—R																																	0	1							102
103	Southern Methodist Univ., Med. Dept.—R																																								103
104	University of Texas, Dept. of Med.—R																																	1	0							104
	VERMONT																																								
105	Univ. of Vermont, College of Med.—R											4	0																							2	0			8	3			105
	VIRGINIA																																								
106	Medical College of Virginia.—R																																								106
107	Univ. of Virginia, Dept. of Med.—R	1	1					1	0					1	0					2	0																					107
108	University College of Medicine.—R	1	0									1	0							1	0															1	0					108
	WISCONSIN																																								
109	Marquette University, Med. Dept.—R																							3	2			3	1													109
110	Wisconsin Coll. of Phys. and Surgs.—R																																								110
	CANADIAN																																								
111	Dalhousie Medical College																																					1	0			111
112	Laval University, Medical Dept																																			2	2			2	4			112
113	Manitoba Medical College																																									113
114	McGill University, Medical Faculty																																			1	0			2	0			114
115	Queens University, Medical Faculty																							0	1											1	0			1	0			115
116	University of Toronto, Faculty of Medicine							1	0															2	0															1	0			116
117	Western University, Medical Dept.																											1	0													117
118	Foreign Colleges							3	0	1	0					1	0							2	1													2	1			118
119	Miscellaneous Medical Colleges	3	4	2	2	2	2	2	1			0	1			1	1	2	2	2	0			7	15	0	1	1	0			6	3	1	2			1	2	5	1	119
	Total by States	149		13		131		176		37		69		18		51		104		18		21		596		93		129		56		94		154		78		196		220		153	
	Totals—Examined—Passed	79		10		105		159		37		58		18		46		82		16		17		474		90		124		45		86		122		64		153		191		152	
	Totals—Examined—Failed	70		3		26		17		0		11		0		5		22		1		4		122		3		5		11		8		32		14		43		29		1	
	Percentage of Failures	47.0		23.1		19.8		9.7		0.		15.8		0.		9.8		21.5		8.3		19.0		20.5		3.2		3.9		19.6		8.5		20.8		18.9		21.9		13.2		0.7	
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21	

R—Regular; H—Homeopathic; E—Eclectic.

Marginal Number	23 Minnesota	24 Mississippi	25 Missouri	26 Montana	27 Nebraska	28 Nevada	29 New Hampshire	30 New Jersey	31 New Mexico	32 New York	33 North Carolina	34 North Dakota	35 Ohio	36 Oklahoma	37 Oregon	38 Pennsylvania	39 Rhode Island	40 South Carolina	41 South Dakota	42 Tennessee	43 Texas	44 Utah	45 Vermont	46 Virginia	47 Washington	48 West Virginia	49 Wisconsin	50 Wyoming	Totals:	Examined—Passed	Examined—Failed	Percentage of Failures	No. States Ex. In	Marginal Number
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
60			1 0	1 0	40 4							1 0						1 0											51	47	4	7.8	7	60
61					7 1														1 0										9	8	1	11.1	2	61
62					8 0																								10	9	1	10.0	3	62
63							2 1			1 0							1 0						2 0						16	14	2	12.5	6	63
64										30 20																			54	34	20	37.0	4	64
65	1 0			2 0			1 0	2 0		64 8					2 0													88	79	9	10.2	13	65
66							4 0			22 0														1 0					31	31	0	0.	7	66
67							1 1			7 6																			17	9	8	47.1	4	67
68										11 7										1 0									19	12	7	36.8	2	68
69						1 0	5 0			61 17	1 0																		86	69	17	19.8	5	69
70							4 0			13 5		2 0																	30	25	5	16.7	7	70
71										3 2																			5	3	2	40.0	1	71
72										20 5																			25	20	5	20.0	1	72
73							7 0			70 6							1 0												88	82	6	6.8	7	73
74										31 10														1 0					44	34	10	22.7	4	74
75		0 1									8 12						2 2						7 10		1 2				54	24	30	55.6	8	75
76											20 5						0 1												27	21	6	22.2	3	76
77										1 0			18 0																20	20	0	0.	3	77
78													10 3																13	10	3	23.1	1	78
79													6 2		0 1				2 0					0 1	0 2				24	18	6	25.0	9	79
80										0 1			47 2											2 0	1 0				60	56	4	6.7	10	80
81													54 1		2 0														58	57	1	1.7	3	81
82													9 1																10	9	1	10.0	1	82
83										1 0			34 0						2 0										37	37	0	0.	3	83
84														9 1	0 1														12	10	2	16.7	3	84
85															1 8									1 0					10	2	8	80.0	2	85
86															8 7									3 1					22	14	8	36.4	3	86
87							2 0			5 1			1 0																15	14	1	6.7	8	87
88		4 0	1 0		2 0	1 0	10 0			2 2	13 0		2 0		1 0		3 0	2 0	1 0			2 0		3 0	3 0	1 0			97	92	5	5.2	31	88
89		1 0					6 0						1 0				1 1					1 0	2 0						32	28	4	12.5	14	89
90																													4	4	0	0.	2	90
91	2 0	1 0	1 0				7 0			6 2			4 0				1 0		1 0	2 0	1 0		3 0			2 0			59	56	3	5.1	24	91
92			1 0							0 1			1 0		1 0										4 0	0 1			12	10	2	16.7	9	92
93	1 1						1 0			4 4	1 0									1 0		1 0		1 0			1 0		31	24	7	22.6	17	93
94	0 1										1 0						57 13												81	66	15	18.5	6	94
95		20 18												6 3					36 2	2 3			1 0						153	96	57	37.3	12	95
96		0 2	3 4								0 2			6 5			0 2		32 3	8 3			4 1		1 0				119	78	41	34.5	18	96
97											0 2		1 0				0 1		11 2				2 0						22	15	7	31.8	8	97
98		2 2												1 0					20 1	1 0			0 1		1 0				48	35	13	27.1	14	98
99											0 1			3 1			0 1		4 2				0 2						18	8	10	55.6	6	99
100		1 0	2 0	0 1						1 0	1 0			4 0			2 0		15 0	4 0				1 0					53	51	4	7.3	18	100
101																				15 2									17	15	2	11.8	1	101
102														2 0						13 1									17	15	2	11.8	3	102
103														1 0						12 1									14	13	1	7.2	2	103
104																				47 0									48	48	0	0.	2	104
105			1 0			3 0				1 1						2 1						2 1							59	53	6	10.2	8	105
106										1 1	4 1												34 6		1 0				49	41	8	16.3	5	106
107		2 0								0 1	3 0				1 1		1 0			1 0			8 0		1 0				24	21	3	12.5	11	107
108										1 0	11 1												21 1		1 0				40	38	2	5.0	8	108
109		0 1	3 1									1 0		1 0					4 0							32 6	1 0		59	48	11	18.6	9	109
110		1 0												1 0												10 1			13	12	1	7.7	3	110
111																													1	1	0	0.	1	111
112						1 0										2 1													14	7	7	50.0	4	112
113												1 0																	1	1	0	0.	1	113
114									3 1							1 0				1 0				1 0					10	9	1	10.0	6	114
115									3 1						1 0						0 1					1 0			10	7	3	30.0	7	115
116	1 0								3 0			0 1	1 0																10	9	1	10.0	7	116
117																													1	1	0	0.	1	117
118		1 0	1 0			2 0	0 1			2 4			1 1											0 1		1 0			26	17	9	34.6	13	118
119	3 1	9 16	2 0			1 0				0 1	0 4		1 0	6 1	1 1		0 2		9 7				2 3	2 2	1 1				148	72	76	51.4	29	119
	52	95	205	39	86	3	32	60	2	539	115	13	208	89	78	.....	41	120	12	180	147	17	43	132	64	78	83	6	5257	.....	.....	.....	.....	
	47	53	177	35	76	3	28	54	2	406	81	10	197	70	52	.....	33	88	12	162	136	16	41	103	51	58	65	6	.....	4342	.....	.....	.....	
	5	42	28	4	10	0	4	6	0	139	34	3	11	19	26	.....	8	32	0	18	11	1	2	29	13	20	18	0	.....	.....	915	.....	.....	
	9.6	44.2	13.7	10.3	11.6	0.	12.5	10.0	0.	24.3	29.6	23.1	5.3	21.3	33.3	.....	19.5	26.7	0.	10.0	7.5	5.9	4.7	22.0	20.3	25.6	21.7	0.	.....	.....	.....	17.4	.....	
	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49						

Marginal Number	NAME OF COLLEGE	Graduates of All Years.					Graduates of 1908-1912.					Graduates of 1907 and Previous.					Graduates of 1912.					Marginal Number
		Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	
	ALABAMA																					
1	Birmingham Medical College.—R	49	27	22	44.9	5	48	26	22	45.8	4	1	1	0	0.	1	33	15	18	54.5	3	1
2	University of Alabama, Medical Dept.—R	49	37	12	24.5	6	48	37	11	22.9	5	1	0	1	100.0	1	38	30	8	21.1	4	2
	ARKANSAS																					
3	College of Physicians and Surgeons.—R	7	3	4	57.1	3	7	3	4	57.1	3											3
4	University of Arkansas, Medical Dept.—R	59	46	13	22.0	5	56	43	13	23.2	5	3	3	0	0.	2	53	41	12	22.6	5	4
	CALIFORNIA																					
5	College of P. and S., Los Angeles.—R	32	29	3	9.4	6	32	29	3	9.4	6						25	22	3	12.0	3	5
6	College of P. and S., San Francisco.—R	10	5	5	50.0	4	9	4	5	55.6	3	1	1	0	0.	1	3	1	2	66.7	1	6
7	Cooper Medical College.—R	34	31	3	8.8	2	33	31	2	6.1	2	1	0	1	100.0	1	31	29	2	6.5	2	7
8	Hahnemann Medical College of the Pacific.—H	4	3	1	25.0	1	4	3	1	25.0	1						4	3	1	25.0	1	8
9	Oakland College of Medicine and Surgery.—R	7	6	1	14.3	1	7	6	1	14.3	1						7	6	1	14.3	1	9
10	University of California, Medical Dept.—R	35	35	0	0.	3	34	34	0	0.	2	1	1	0	0.	1	26	26	0	0.	1	10
	COLORADO																					
11	University of Colorado, Medical Dept.—R	47	44	3	6.4	10	44	43	1	2.3	10	3	1	2	66.7	2	21	21	0	0.	4	11
	CONNECTICUT																					
12	Yale Medical College.—R	30	28	2	6.7	6	28	26	2	7.1	5	2	2	0	0.	2	15	15	0	0.	2	12
	DISTRICT OF COLUMBIA																					
13	George Washington University.—R	47	40	7	14.9	10	44	37	7	15.9	14	3	3	0	0.	3	25	23	2	8.0	8	13
14	Georgetown University, School of Medicine.—R	26	21	5	19.2	9	24	20	4	16.7	7	2	1	1	50.0	2	8	7	1	12.5	2	14
15	Howard University, Medical Dept.—R	48	37	13	27.1	16	41	32	9	22.0	13	7	3	4	57.1	4	22	18	4	18.2	9	15
	GEORGIA																					
16	Atlanta College of Physicians and Surgeons.—R	79	73	6	7.6	8	78	73	5	6.4	7	1	0	1	100.0	1	72	68	4	5.6	3	16
17	Atlanta School of Medicine.—R	65	55	10	15.4	9	65	55	10	15.4	9						59	53	6	10.2	8	17
18	Georgia College of Eclectic Med. and Surg.—E	4	1	3	75.0	3	3	0	3	100.0	2	1	1	0	0.	1	3	1	2	66.7	2	18
19	South. College of Med. and Surg., Atlanta.—R	5	3	2	40.0	2	5	3	2	40.0	2						5	3	2	40.0	2	19
20	Medical College of Georgia.—R	41	35	6	14.6	4	41	35	6	14.6	4						38	34	4	10.5	3	20
	ILLINOIS																					
21	Bennett Medical College.—R	98	75	23	23.5	16	93	71	22	23.7	14	5	4	1	20.0	4	65	57	8	12.3	10	21
22	Chicago College of Medicine and Surgery.—R	166	134	32	19.3	24	161	131	30	18.6	23	5	3	2	40.0	3	120	105	15	12.5	16	22
23	College of Physicians and Surgeons.—R	212	177	38	17.8	19	194	161	33	17.0	17	19	14	5	26.3	7	148	129	19	12.8	13	23
24	Hahnemann Medical College and Hospital.—H	63	44	19	30.1	19	47	34	13	27.7	12	16	10	6	37.5	10	32	23	9	28.1	5	24
25	Hering Medical College.—H	9	6	3	33.3	6	9	6	3	33.3	6						5	3	2	40.0	3	25
26	Jenner Medical College.—R	14	11	3	21.4	3	12	10	2	16.7	3	2	1	1	50.0	1	9	8	1	11.1	2	26
27	Northwestern University Medical School.—R	139	131	8	5.8	22	130	122	8	6.2	20	9	9	0	0.	8	72	68	4	5.6	12	27
28	Rush Medical College.—R	166	158	8	4.8	25	137	134	3	2.2	21	29	24	5	17.2	13	90	88	2	2.2	15	28
	INDIANA																					
29	Indiana University, School of Medicine.—R	50	49	1	2.0	5	50	49	1	2.0	5						45	45	0	0.	1	29
	IOWA																					
30	Drake University, College of Medicine.—R	21	21	0	0.	6	19	19	0	0.	4	2	2	0	0.	2	17	17	0	0.	2	30
31	State University of Iowa, College of Med.—R	49	44	5	10.5	8	38	38	1	2.6	5	10	6	4	40.0	5	35	35	0	0.	2	31
32	State University of Iowa, Homeo. Dept.—H	5	5	0	0.	2	4	4	0	0.	1	1	1	0	0.	1	4	4	0	0.	1	32
	KANSAS																					
33	Kansas Medical College.—R	15	15	0	0.	5	15	12	0	0.	3	3	3	0	0.	2	9	9	0	0.	1	33
34	University of Kansas, School of Medicine.—R	15	13	2	13.3	4	15	13	2	13.3	4						15	13	2	13.3	4	34
	KENTUCKY																					
35	University of Louisville, Medical Dept.—R	188	154	34	18.1	34	177	146	31	17.5	31	11	8	3	27.3	9	119	106	13	10.9	28	35
	LOUISIANA																					
36	Tulane University, Medical Dept.—R	154	140	14	9.1	16	147	135	12	8.2	12	7	5	2	28.6	6	125	120	5	4.0	16	36
	MAINE																					
37	Medical School of Maine.—R	18	16	2	11.1	4	15	15	0	0.	4	3	1	2	66.7	2	9	9	0	0.	2	37
	MARYLAND																					
38	Baltimore Medical College.—R	59	44	15	25.4	18	42	34	8	19.0	13	17	10	7	41.2	13	22	20	2	9.1	6	38
39	College of Physicians and Surgeons.—R	75	58	17	22.7	19	65	50	15	23.1	14	10	8	2	20.0	8	42	33	9	21.4	8	39
40	Johns Hopkins University, Medical Dept.—R	95	90	5	5.3	19	86	81	5	5.8	15	9	9	0	0.	8	64	62	2	3.1	11	40
41	Maryland Medical College.—R	81	35	46	56.8	12	78	33	45	57.7	12	3	2	1	33.3	2	52	22	30	57.7	10	41
42	University of Maryland, School of Medicine.—R	99	86	13	13.1	19	85	74	11	12.9	16	14	12	2	14.3	11	64	57	7	10.9	13	42
	MASSACHUSETTS																					
43	Boston University, School of Medicine.—H	30	29	1	3.3	6	26	25	1	3.8	6	4	4	0	0.	3	21	20	1	4.8	3	43
44	College of Physicians and Surgeons.—R	43	31	12	28.0	10	41	30	11	26.9	10	2	1	1	50.0	2	14	12	2	14.3	5	44
45	Harvard Medical School—R	85	75	10	11.8	20	73	64	9	12.3	18	12	11	1	8.3	7	31	28	3	9.7	11	45
46	Tufts College Medical School—R	119	107	12	10.1	11	107	99	8	7.5	7	12	8	4	33.3	8	61	58	3	4.9	6	46
	MICHIGAN																					
47	Detroit College of Medicine—R	44	43	1	2.3	6	39	39	0	0.	2	5	4	1	20.0	4	38	38	0	0.	1	47
48	Univ. of Mich., Dept. of Med. and Surg.—R	107	105	2	1.9	16	93	93	0	0.	11	14	12	2	14.3	10	82	82	0	0.	6	48
49	Univ. of Mich., Homeopathic College.—H	19	19	0	0.	3	19	19	0	0.	4						18	18	0	0.	3	49
	MINNESOTA																					
50	Univ. of Minn., College of Med and Surg.—R	52	50	2	3.8	7	39	39	0	0.	5	13	11	2	15.4	6	31	31	0	0.	3	50
	MISSOURI																					
51	American Medical College.—E	61	43	18	29.5	8	57	40	17	29.8	6	4	3	1	25.0	4	53	38	15	28.3	6	51
52	Barnes Medical College.—R	39	20	19	48.7	16	18	11	7	38.9	8	21	9	12	57.1	14						52
53	Eclectic Medical University, Kansas City.—E	13	13	0	0.	1	13	13	0	0.	1						11	11	0	0.	1	53
54	Ensworth Medical College.—R	13	5	8	61.5	6	12	5	7	58.3	5	1	0	1	100.0	1	7	4	3	42.9	2	54
55	Kansas City Hahnemann Med. College.—H	15	10	5	33.3	5	14	9	5	35.7	5	1	1	0	0.	1	12	9	3	25.0	4	55
56	St. Louis University, School of Medicine.—R	91	88	3	3.3	16	88	86	2	2.3	15	3	2	1	33.3	3	77	75	2	2.6	10	56
57	St. Louis College of Phys. and Surg.—R	37	16	21	56.7	18	27	11	16	59.2	12	10	5	5	50.0	9	5	3	2	40.0	1	57
58	University Medical College, Kansas City.—R	46	39	7	15.2	12	39	32	7	18.0	7	7	7	0	0.	7	34	28	6	17.6	5	58
59	Washington University, Medical Dept.—R	67	65	2	3.0	12	57	56	1	1.8	11	10	9	1	10.0	4	47	47	0	0.	4	59

R—Regular; H—Homeopathic; E—Eclectic.

Marginal Number	NAME OF COLLEGE	Graduates of All Years. Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Graduates of 1908-1912. Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Graduates of 1907 and Previous. Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Graduates of 1912. Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Marginal Number
	NEBRASKA																					
60	John A. Creighton Medical College.—R	55	50	5	9.1	8	51	47	4	7.8	7	4	3	1	25.0	4	44	42	2	4.5	6	60
61	Lincoln Medical College.—E	15	10	2	16.7	3	9	8	1	11.1	2	3	2	1	33.3	2	7	6	1	14.3	1	61
62	University of Nebraska, College of Med.—R	14	13	1	7.2	6	10	9	1	10.0	3	4	4	0	0.	4	8	8	0	0.	2	62
	NEW HAMPSHIRE																					
63	Dartmouth Medical School.—R	17	15	2	11.8	6	16	14	2	12.5	6	1	1	0	0.	1	8	7	1	12.5	4	63
	NEW YORK																					
64	Albany Medical College.—R	56	36	20	35.7	5	54	34	20	37.0	4	2	2	0	0.	2	29	25	8	27.6	1	64
65	Columbia Univ., College of Phys and Surg.—R	105	95	10	9.5	17	88	79	9	10.2	13	17	16	1	5.9	11	57	52	5	8.8	3	65
66	Cornell University Medical College.—R	34	34	0	0.	8	31	31	0	0.	7	3	3	0	0.	2	8	8	0	0.	1	66
67	Eclectic Med. Coll. of City of New York.—E	17	9	8	47.1	4	17	9	8	47.1	4	.....	.....	.....	.....	.....	10	6	4	40.0	2	67
68	Fordham University, School of Medicine.—R	19	12	7	36.8	2	19	12	7	36.8	2	.....	.....	.....	.....	.....	9	6	3	33.3	1	68
69	Long Island College Hospital.—R	93	75	18	19.4	10	86	69	17	19.8	5	7	6	1	14.3	6	38	29	9	23.7	3	69
70	New York Homeo. Med. Coll. and Hosp.—H	33	28	5	15.2	8	30	25	5	16.7	7	3	3	0	0.	3	15	14	1	6.7	4	70
71	New York Med. Coll. and Hosp. for Women.—H	5	3	2	40.0	1	5	3	2	40.0	1	.....	.....	.....	.....	.....	2	2	0	0.	1	71
72	Syracuse University, College of Medicine.—R	30	25	5	16.7	5	25	20	5	20.0	1	5	5	0	0.	4	13	11	2	15.4	1	72
73	University and Bellevue Hosp. Med. Coll.—R	90	83	7	7.8	8	88	82	6	6.8	7	2	1	1	50.0	2	62	58	4	6.5	2	73
74	University of Buffalo, Medical Dept.—R	50	38	12	24.0	6	44	34	10	22.7	4	6	4	2	33.3	4	31	23	8	25.8	2	74
	NORTH CAROLINA																					
75	Leonard School of Medicine.—R	56	24	32	57.1	8	54	24	30	55.6	8	2	0	2	100.0	2	26	23	13	36.1	7	75
76	North Carolina Medical College.—R	29	22	7	24.1	4	27	21	6	22.2	3	2	1	1	50.0	2	25	19	6	24.0	3	76
	OHIO																					
77	Cleveland College of Phys. and Surg.—R	20	20	0	0.	3	20	20	0	0.	3	.....	.....	.....	.....	.....	18	18	0	0.	1	77
78	Cleveland-Pulte Medical College.—H	13	10	3	23.1	1	13	10	3	23.1	1	.....	.....	.....	.....	.....	13	10	3	23.1	1	78
79	Eclectic Medical College.—E	28	22	6	21.4	10	24	18	6	25.0	9	4	4	0	0.	3	17	15	2	11.8	6	79
80	Ohio-Miami Medical College.—R	60	56	4	6.7	10	60	56	4	6.7	10	.....	.....	.....	.....	.....	53	51	2	3.8	5	80
81	Starling-Ohio Medical College.—R	58	57	1	1.7	3	58	57	1	1.7	3	.....	.....	.....	.....	.....	55	54	1	1.8	1	81
82	Toledo Medical College.—R	10	9	1	10.0	1	10	9	1	10.0	1	.....	.....	.....	.....	.....	10	9	1	10.0	1	82
83	Western Reserve University, Med. Dept.—R	38	38	0	0.	4	37	37	0	0.	3	1	1	0	0.	1	35	35	0	0.	2	83
	OKLAHOMA																					
84	University of Oklahoma, School of Medicine—R	12	10	2	16.7	3	12	10	2	16.7	3	.....	.....	.....	.....	.....	10	9	1	10.0	1	84
	OREGON																					
85	Willamette University, Medical Dept.—R	12	2	10	83.3	3	10	2	8	80.0	2	2	0	2	100.0	2	8	1	7	87.5	1	85
86	University of Oregon, Medical Dept.—R	25	14	11	44.0	4	22	14	8	36.4	3	3	0	3	100.0	3	14	8	6	42.8	2	86
	PENNSYLVANIA																					
87	Hahnemann Medical College and Hosp.—H	22	21	1	4.5	13	15	14	1	6.7	8	7	7	0	0.	6	6	6	0	0.	4	87
88	Jefferson Medical College.—R	124	115	9	7.3	34	97	92	5	5.2	31	27	23	4	14.8	17	65	62	3	4.6	22	88
89	Medico-Chirurgical College of Philadelphia.—R	40	34	6	15.0	18	32	28	4	12.5	14	8	6	2	25.0	5	20	17	3	15.0	7	89
90	Temple University, Medical Dept.—R	4	4	0	0.	3	4	4	0	0.	3	.....	.....	.....	.....	.....	3	3	0	0.	1	90
91	University of Pennsylvania, Dept. of Med.—R	79	72	7	8.9	28	59	56	3	5.1	24	20	16	4	20.0	10	24	23	1	4.2	13	91
92	Univ. of Pittsburgh, School of Medicine.—R	12	10	2	16.7	9	12	10	2	16.7	9	.....	.....	.....	.....	.....	5	5	0	0.	2	92
93	Woman's Med. Coll. of Pennsylvania.—R	38	30	8	21.1	21	31	24	7	22.6	17	7	6	1	14.3	6	13	10	3	23.1	7	93
	SOUTH CAROLINA																					
94	Med. Coll. of the State of South Carolina.—R	86	71	15	17.4	6	81	66	15	18.5	6	5	5	0	0.	3	67	59	8	11.9	4	94
	TENNESSEE																					
95	Memphis Hospital Medical College.—R	163	104	59	36.2	14	153	96	57	37.3	12	10	8	2	20.0	8	110	79	31	28.2	11	95
96	Meharry Medical College.—R	132	81	51	38.6	18	119	78	41	34.5	18	13	3	10	76.9	6	84	58	26	31.0	15	96
97	Lincoln Memorial Univ., Medical Dept.—R	29	19	10	34.5	13	22	15	7	31.8	8	7	4	3	42.9	6	16	12	4	25.0	4	97
98	University of Tennessee, Medical Dept.—R	51	36	15	29.4	15	48	35	13	27.1	14	3	1	2	66.7	2	33	26	7	21.2	10	98
99	University of West Tennessee, Medical Dept.—R	20	9	11	55.0	6	18	8	10	55.6	6	2	1	1	50.0	1	9	6	3	33.3	4	99
100	Vanderbilt University, Medical Dept.—R	61	56	5	8.2	19	55	51	4	7.3	18	6	5	1	16.7	4	39	37	2	5.1	15	100
	TEXAS																					
101	Baylor University, College of Medicine—R	17	15	2	11.8	1	17	15	2	11.8	1	.....	.....	.....	.....	.....	17	15	2	11.8	1	101
102	Texas Christian University, Medical Dept.—R	18	16	2	11.1	3	17	15	2	11.8	3	1	1	0	0.	1	16	15	1	6.3	2	102
103	Southern Methodist Univ., Medical Dept.—R	14	13	1	7.2	2	14	13	1	7.2	2	.....	.....	.....	.....	.....	13	12	1	7.7	2	103
104	University of Texas, Dept. of Medicine.—R	49	49	0	0.	2	48	48	0	0.	2	1	1	0	0.	1	45	45	0	0.	1	104
	VERMONT																					
105	University of Vermont, College of Medicine.—R	63	56	7	11.1	9	59	53	6	10.2	8	4	3	1	25.0	4	33	32	1	3.0	4	105
	VIRGINIA																					
106	Medical College of Virginia.—R	50	41	9	18.0	5	49	41	8	16.3	5	1	0	1	100.0	1	29	25	4	10.3	4	106
107	University of Virginia, Dept. of Medicine.—R	32	29	3	9.4	15	24	21	3	12.5	11	8	8	0	0.	6	7	7	0	0.	2	107
108	University College of Medicine.—R	42	39	3	7.1	9	40	38	2	5.0	8	2	1	1	50.0	2	34	33	1	2.9	5	108
	WISCONSIN																					
109	Marquette University, Medical Dept.—R	61	50	11	18.0	11	59	48	11	18.6	9	2	2	0	0.	2	47	41	6	12.8	7	109
110	Wisconsin College of Physicians and Surgs.—R	14	13	1	7.2	4	13	12	1	7.7	3	1	1	0	0.	1	13	12	1	7.7	3	110
	CANADIAN																					
111	Dalhousie Medical College	1	1	0	0.	1	1	1	0	0.	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	111
112	Laval University, Medical Dept.	19	9	10	52.6	8	14	7	7	50.0	4	5	2	3	60.0	4	2	1	1	50.0	2	112
113	Manitoba Medical College	3	3	0	0.	3	1	1	0	0.	1	2	2	0	0.	2	1	1	0	0.	1	113
114	McGill University, Medical Faculty	21	20	1	4.8	10	10	9	1	10.0	6	11	11	0	0.	7	4	3	1	25.0	3	114
115	Queens University, Medical Faculty	12	7	5	41.7	8	10	7	3	30.0	7	2	0	2	100.0	2	3	1	2	66.7	3	115
116	University of Toronto, Faculty of Medicine	17	15	2	11.8	11	10	9	1	10.0	7	7	6	1	14.3	5	.....	.....	.....	.....	.....	116
117	Western University, Medical Dept.	1	1	0	0.	1	1	1	0	0.	1	.....	.....	.....	.....	.....	1	1	0	0.	1	117
118	Foreign Colleges	88	53	35	39.8	25	26	17	9	34.6	13	62	36	26	41.9	22	1	1	0	0.	1	118
119	Miscellaneous Medical Colleges	375	224	151	40.3	45	148	72	76	51.4	29	227	152	75	33.0	40	27	18	9	33.3	5	119
120	Undergraduates	253	165	88	34.8	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	120
	Totals	6353	5110	1243	17.8	....	5257	4342	915	17.4	....	843	603	240	29.7	....	3625	3172	453	12.5		

R—Regular; H—Homeopathic; E—Eclectic.

CONTINUED FROM PAGE 1623

shows that 3,625 or 57.2 per cent. of all candidates examined during the year graduated in 1912, including twelve who graduated in Canada and other foreign colleges. Educational statistics show that the medical colleges of the United States graduated 4,483 students last year; therefore, 80.9 per cent. of all graduates in 1912 took examinations for license during that year. These figures would be changed somewhat if the Pennsylvania figures could have been included. In some of the states graduates in medicine are allowed to serve hospital internships without first becoming licensed practitioners, which doubtless accounts for some of the remaining 20 per cent. Of those examined 453, or 12.5 per cent., failed.

Table C permits of an interesting study of medical schools from the standpoint of state board examinations. For some colleges a marked improvement in teaching methods is apparent from the fact that while the percentages of failures are high for old practitioners they are lower for recent graduates and still lower for graduates of 1912. Other colleges, however, show no improvement either for recent graduates, or for graduates of 1912. In the latter instance a knowledge of these colleges, based on a careful study, which included inspections of the colleges, bears out what the figures of this table indicate, that some of these institutions are teaching medicine no better to-day than they did ten or more years ago.

TABLE D.—COLLEGES GROUPED BY STATES
Showing the Number Examined and Percentage of Failures

All Colleges of	Graduates. Of All Years. Number Examined.	Of All Years. Per Cent. Failed.	Of 1908 to 1912. Number Examined.	Of 1908 to 1912. Per Cent. Failed.	Of 1907 & Prev. Number Examined.	Of 1907 & Prev. Per Cent. Failed.	Of 1912. Number Examined.	Of 1912. Per Cent. Failed.	State Rank According to the Number Examined.	Rank According to Successes at Examinations.
Alabama	98	34.7	96	34.4	2	50.0	71	36.6	16	28
Arkansas	66	25.8	63	27.0	3	0.	53	22.6	21	26
California	122	10.7	119	10.1	3	33.3	96	9.4	14	11
Colorado	47	6.4	44	2.3	3	66.7	21	0.	25	5
Connecticut	30	6.7	28	7.1	2	0.	15	0.	27	7
District of Columbia	121	20.7	109	18.3	12	41.7	55	12.7	15	23
Georgia	194	13.9	192	13.5	2	50.0	177	10.2	9	16
Illinois	868	15.3	783	14.6	85	23.5	541	10.9	1	17
Indiana	50	2.0	50	2.0	.....	.....	45	0.	24	2
Iowa	75	6.7	62	1.6	13	30.8	56	0.	20	3
Kansas	30	6.7	27	7.5	3	0.	24	8.3	27	4
Kentucky	188	18.1	177	17.5	11	27.3	119	10.9	10	22
Louisiana	154	9.1	147	8.2	7	28.6	125	4.0	12	8
Maine	18	11.1	15	0.	3	66.7	9	0.	28	12
Maryland	409	23.5	356	23.6	53	22.6	244	29.5	4	25
Massachusetts	277	12.6	247	11.7	30	20.0	127	7.1	7	15
Michigan	170	1.8	151	0.	19	15.8	138	0.	11	1
Minnesota	52	3.8	39	0.	13	15.4	31	0.	23	3
Missouri	382	21.7	325	19.1	57	36.8	246	12.6	5	24
Nebraska	81	9.9	70	8.6	11	18.2	59	5.1	19	9
New Hampshire	17	11.8	16	12.5	1	0.	8	12.5	29	13
New York	532	17.7	487	18.3	45	11.1	274	16.1	2	21
North Carolina	85	45.9	81	44.4	4	75.0	61	31.3	18	29
Ohio	227	6.6	222	6.8	5	0.	201	4.5	8	6
Oklahoma	12	16.7	12	16.7	.....	.....	10	10.0	30	19
Oregon	37	56.7	32	50.0	5	100.0	22	59.1	26	30
Pennsylvania	319	10.3	250	8.8	69	15.8	136	7.4	6	10
South Carolina	86	17.4	81	18.5	5	0.	67	11.9	17	20
Tennessee	456	33.3	415	31.8	41	46.3	291	25.1	3	27
Texas	98	5.1	96	5.2	2	0.	91	4.4	16	4
Vermont	63	11.1	59	10.2	4	25.0	33	3.0	22	12
Virginia	124	12.1	113	11.5	11	18.2	80	6.2	13	14
Wisconsin	75	16.0	72	16.7	3	0.	60	11.7	20	18
Totals Examined in 1912	5563	17.1	5036	16.2	527	25.2	3586	12.3	.....	.....

This table gives data relating to the group of colleges in each state. For example, it shows that of all the medical schools in New York 532 graduates of various years were examined by state boards during 1912, of which number 17.7 per cent. failed. Of the 487 who graduated in recent years, however, (1908 to 1912 inclusive), 18.3 per cent. failed; of the 45 who graduated previous to 1908, 11.1 per cent. failed, and of the 274 graduates of 1912 16.1 per cent. failed.

The ninth column gives the rank of each state group of colleges according to the number of applicants. The Illinois group of colleges leads, having 868 graduates examined by state boards during 1912, followed by New York with 532, Tennessee with 456, Maryland with 409 and Missouri with 382.

The tenth column gives the rank of each state group of colleges according to the success of the graduates at state board examinations. It is interesting to compare the figures of these two last columns. While the Illinois group ranks first according to the number examined it ranks as the seventeenth in the success of its graduates at examinations. While New York ranks second as to the number examined, it ranks as the twenty-first in the success of its graduates at examinations and while Tennessee ranks third as to the number examined, it ranks as the twenty-seventh in the success of its graduates at examinations.

TOTAL RESULTS
Comparison with Previous Years.

Year.	Table A. Total Examined.	Examined—Passed.	Examined—Failed.	Percentage Failed.	B. Recent Grads. Examined.	Percentage Failed.	C. Older Prac. Examined.	Percentage Failed.	A. Non-Grads. Examined.	Percentage Failed.	K. Regist., Without Written Examination	Total Registered.
1904	7035	5672	1363	19.3	4773	14.1	579	29.7	515	52.6	999	6671
1905	7170	5680	1490	20.8	6054	16.2	690	37.7	472	61.9	394	6074
1906	8035	6368	1667	20.7	6250	16.4	793	27.1	703	51.3	1497	7865
1907	7271	5723	1548	21.3	5922	15.1	675	27.7	674	69.6	1426	7149
1908	7770	6084	1686	21.7	6477	17.8	796	31.5	494	56.8	1276	7360
1909	7287	5857	1430	19.6	5891	15.4	968	30.0	438	54.1	1373	7230
1910	7004	5712	1292	18.4	5678	14.9	973	29.1	353	45.6	1640	7352
1911	6960	5578	1382	19.9	5685	17.2	945	29.4	330	38.5	1246	6824
1912	6353	5110	1243	17.8	5257	17.4	843	29.7	253	34.8	1257	6723*

* Includes 369 licensed in Pennsylvania.

RESULTS FOR LARGER COLLEGES
Comparison with Previous Years (Table E).

Year.	Colleges Represented.	Total Examined.	Per Cent. Failed.	Colleges, 100 or More Examined.	Total Examined.	Per Cent. Failed.	Colleges, 50 to 100 Examined.	Total Examined.	Per Cent. Failed.	Colleges, Less than 50 Examined.	Total Examined.	Per Cent. Failed.	Foreign, Misc., and Non grads. Exam'd.	Per Cent. Failed.
1904	149	6241	16.4	14	2271	11.7	28	1817	16.9	107	2153	21.0	794	43.1
1905	153	6411	18.3	14	2350	12.4	37	2543	17.7	102	1518	28.9	759	51.1
1906	151	6938	17.3	16	2504	14.5	34	2381	16.9	96	2058	21.3	1097	42.5
1907	146	6207	13.8	12	1626	12.7	36	2578	14.7	98	2003	13.6	1064	55.5
1908	137	6491	17.2	19	2596	15.6	26	1825	15.5	92	2070	20.8	1279	14.6
1909	134	6341	16.2	17	2476	16.9	27	1920	12.3	90	1945	19.2	946	42.6
1910	121	5953	15.3	17	2379	13.3	25	1791	13.7	79	1783	19.3	1051	36.5
1911	119	6002	17.2	18	2508	11.0	28	1895	17.1	73	1659	20.1	808	37.6
1912	110	5563	17.1	12	1776	15.6	31	2148	17.3	67	1639	18.5	790	37.0

STUDY OF TOTALS AND PERCENTAGES

A study of totals and percentages as compared with previous years is of interest. The total examined and the percentage of failures, shown in Table A, are the lowest since the compiling of these statistics was begun in 1904. The total examined in 1912 shows a decrease of 1,682 below 1906, when 8,035 candidates were examined. By all methods—examination, reciprocity, under exemption, etc.—6,723 physicians were licensed during 1912, or 101 less than in 1911 and 1,142 less than in 1906, when 7,865 physicians were licensed.

Other deductions from the larger tables have been made and are presented in Tables D to M, which are worthy of careful study.

STUDY OF COLLEGES BY STATE GROUPS

Table D is based on the first four large tables and gives the results for the group of colleges located in each state. It shows what states are furnishing the largest number of physicians and the failure percentages indicate what kind of training these colleges are furnishing so far as may be judged from the failures of their graduates before state boards. By comparing the percentages of the first column with the other columns it can be seen whether there has been any reduction in failures for graduates of recent years. Of the thirty-three states having medical colleges which grant degrees, fifteen furnished 100 or more candidates examined. Of these fifteen groups of colleges, three had failure percentages of less than 10 per cent.; eight had failure percentages between 10 and 20, and four had over 20 per cent. of failures. The highest failure percentage was obtained by the Ore-

gon group with 56.7. Of the states having 100 or more candidates examined, however, the highest failure percentage was obtained by the Tennessee group, which had 33.3 per cent., followed by the Maryland group with 23.5 per cent., and the Missouri group with 21.7 per cent. of their graduates failing. Other deductions are given with the table.

Study of Larger Colleges

Table D, is also based on the three large tables and gives the results of state board examinations as they affect the forty-three largest medical colleges. Although these colleges represent 39 per cent. of the medical colleges in the United States having graduates examined, they furnished 70.5 per cent. of all the candidates for license coming from medical schools of the United States. This table shows that the graduation of large classes by a medical college does not prove excellence of teaching since several colleges having 100 or more examined have very high failure percentages and this holds true even for the graduates of 1912. In fact, the larger the college from the standpoint of the number of students and graduates the more serious is inferior teaching ability, indicated by a high failure percentage. In fairness to the medical student, and in the interests of the public, such schools should greatly strengthen their teaching facilities or reduce the size of their classes.

Altogether for these schools 648 or 16.5 per cent. failed, as compared with 18.5 per cent. of failures for the 1,639 candidates from the sixty-seven colleges having less than fifty each examined.

Besides the graduates of the medical colleges of the United States 790 candidates were examined, made up of seventy-four graduates of Canadian colleges, 88 foreign college graduates, 375 graduates of miscellaneous colleges and 253 non-graduates. Of these 790 candidates, 292 or 37 per cent. failed.

TABLE E—COLLEGES HAVING FIFTY OR MORE EXAMINED

Table Shows Total Number Examined, Total Number Passed, Total Number Failed, Percentage of Failures and Number of States in Which Each College Had Representatives

College	Graduates, All Years.					Graduates of 1908-1912.					Graduates, 1907 and Previous.					Graduates of 1912.					Marginal Number.
	Total Examined.	Number Passed.	Number Failed.	Per Cent. of Failures.	No. States.	Total Examined.	Number Passed.	Number Failed.	Per Cent. of Failures.	No. States.	Total Examined.	Number Passed.	Number Failed.	Per Cent. of Failures.	No. States.	Total Examined.	Number Passed.	Number Failed.	Per Cent. of Failures.	No. States.	
College of Physicians and Surgeons, Chicago	213	175	38	17.8	19	194	161	33	17.0	17	19	14	5	26.3	7	148	129	19	2.8	15	23
University of Louisville, Medical Department	188	154	34	18.1	34	177	146	31	17.5	31	11	8	3	27.3	9	119	106	13	10.9	20	35
Chicago College of Medicine and Surgery	166	134	32	19.3	24	161	131	30	18.6	23	5	3	2	40.0	3	120	105	15	12.5	16	22
Rush Medical College	166	158	8	4.8	25	137	134	3	2.2	21	29	24	5	17.2	13	90	88	2	2.2	15	28
Memphis Hospital Medical College	163	104	59	36.2	14	153	96	57	37.3	13	10	8	2	20.0	8	110	79	31	28.2	11	95
Tulane University, Medical Department	154	140	14	9.1	16	147	135	12	8.2	12	7	5	2	28.6	6	125	120	5	4.0	10	36
Northwestern University Medical School	139	131	8	5.8	22	130	122	8	6.2	21	9	9	0	0.	8	72	68	4	5.6	12	27
Meharry Medical College	132	81	51	38.6	18	119	78	41	34.5	12	13	3	10	76.9	6	84	58	26	31.0	15	96
Jefferson Medical College	124	115	9	7.3	34	97	92	5	5.2	31	27	23	4	14.8	17	65	62	3	4.6	22	88
Tufts College Medical School	119	107	12	10.1	11	107	99	8	7.5	7	12	8	4	33.3	8	61	58	3	4.9	6	46
University of Michigan, Dept. of Med and Surg.	107	105	2	1.9	16	93	93	0	0.	11	14	12	2	14.3	10	82	82	0	0.	6	48
Columbia University, College of Phys. and Surg.	105	95	10	9.5	17	88	79	9	10.2	13	17	16	1	5.9	11	57	52	5	8.8	3	65
University of Maryland, School of Medicine	99	86	13	13.1	19	85	74	11	12.9	16	14	12	2	14.3	11	64	57	7	10.9	13	42
Bennett Medical College	98	75	23	23.5	16	93	71	22	23.7	14	5	4	1	20.0	4	65	57	8	12.3	10	21
Johns Hopkins University, Medical Department	95	90	5	5.3	19	86	81	5	5.8	15	9	9	0	0.	8	64	62	2	3.1	11	40
Long Island College Hospital	83	75	18	19.4	10	86	69	17	19.8	8	7	6	1	14.3	6	38	29	9	23.7	3	69
St. Louis University, School of Medicine	91	88	3	3.3	16	88	86	2	2.3	15	3	2	1	33.3	3	77	75	2	2.6	10	56
University and Bellevue Hospital Medical Coll.	90	83	7	7.8	8	88	82	6	6.8	7	2	1	1	50.0	2	62	58	4	6.5	2	73
Medical College of the State of South Carolina	86	71	15	17.4	6	81	66	15	18.5	6	5	5	0	0.	3	67	59	8	11.9	5	94
Harvard Medical School	85	75	10	11.8	20	73	64	9	12.3	18	12	11	1	8.3	8	31	28	3	9.7	11	46
Maryland Medical College	81	35	46	56.8	12	78	33	45	57.7	12	3	2	1	33.3	2	52	22	30	57.7	10	41
Atlanta College of Physicians and Surgeons	79	73	6	7.6	8	78	73	5	6.4	7	1	0	1	100.0	1	72	68	4	5.6	5	16
University of Pennsylvania, Dept. of Medicine	79	72	7	8.9	28	50	50	3	5.1	24	20	16	4	20.0	10	24	23	1	4.2	13	91
College of Physicians and Surgeons, Baltimore	75	58	17	22.7	19	65	50	15	23.1	14	10	8	2	20.0	8	42	33	9	21.4	8	39
Washington University, Medical Department	67	65	2	3.0	12	57	56	1	1.8	11	10	9	1	10.0	4	47	47	0	0.	4	50
Atlanta School of Medicine	65	55	10	15.4	9	65	55	10	15.4	9	.....	.....	.....	.....	.....	50	53	6	10.2	8	17
Hahnemann Medical Coll. and Hosp., Chicago	63	44	19	30.1	19	47	34	13	27.7	12	16	10	6	37.5	10	32	23	9	28.1	5	24
University of Vermont, College of Medicine	63	56	7	11.1	9	59	53	6	10.2	8	4	3	1	25.0	4	33	32	1	3.0	4	105
American Medical College, St. Louis	61	43	18	29.5	8	57	40	17	29.8	6	4	3	1	25.0	4	55	38	15	28.3	6	51
Vanderbilt University, Medical Department	61	56	5	8.2	19	55	51	4	7.3	18	6	5	1	16.7	4	39	37	2	5.1	15	100
Marquette University, Medical Department	61	50	11	18.0	11	59	48	11	18.6	9	2	2	0	0.	2	47	41	6	12.8	7	109
Ohio-Miami Medical College	60	56	4	6.7	10	60	56	4	6.7	10	.....	.....	.....	.....	.....	53	51	2	3.8	5	80
University of Arkansas, Medical Department	59	46	13	22.0	5	56	43	13	23.2	5	3	3	0	0.	2	53	41	12	22.6	5	4
Baltimore Medical College	59	44	15	25.4	18	42	34	8	19.0	13	17	10	7	41.2	13	22	20	2	9.1	6	38
Starling-Ohio Medical College	58	57	1	1.7	3	58	57	1	1.7	3	.....	.....	.....	.....	.....	55	54	1	1.8	1	81
Albany Medical College	56	36	20	35.7	5	54	34	20	37.0	4	2	2	0	0.	2	29	31	8	27.6	1	64
Leonard School of Medicine	56	24	32	57.1	8	54	24	30	55.6	8	2	0	2	100.0	2	36	23	13	36.1	7	75
John A. Creighton Medical College	55	50	5	9.1	8	51	47	4	7.8	7	4	3	1	25.0	4	44	42	2	4.5	6	60
University of Minnesota, Coll. of Med and Surg.	52	50	2	3.8	7	39	39	0	0.	5	13	11	2	15.4	6	31	31	0	0.	3	50
University of Tennessee, Medical Department	51	36	15	29.4	15	48	35	13	27.1	14	3	1	2	66.7	2	33	26	7	21.2	10	98
Indiana University, School of Medicine	50	49	1	2.0	5	50	49	1	2.0	5	.....	.....	.....	.....	.....	45	45	0	0.	1	29
University of Buffalo, Medical Department	50	38	12	24.0	6	44	34	10	22.7	4	6	4	2	33.3	4	31	23	8	25.8	2	74
Medical College of Virginia	50	41	9	18.0	5	49	41	8	16.3	5	1	0	1	100.0	1	39	35	4	10.3	5	106
Totals	3924	3276	648	16.5	....	3567	3001	566	15.9	....	357	275	82	23.0	....	2572	2261	311	12.1		

This table is especially interesting, since it gives data relating to the 43 larger medical colleges arranged according to the number of graduates examined. This allows of comparisons between colleges having classes of nearly equal size. This time the College of Physicians and Surgeons of Chicago had the largest number, which position it held also in 1906 and 1907. In 1908 Jefferson Medical College had the highest number examined. In 1909, 1910 and 1911 the University of Louisville Medical Department had the largest number examined. The first place from the standpoint of the number examined, however, does not always mean first place from the standpoint of scholarship. Note the percentages of failures.

Of the 12 colleges having 100 or more examined, 6 have failure percentages of less than 10, while 6 stand out prominently with large failure percentages of 10.1, 17.8, 18.1, 19.3, 36.2 and 38.6. This marked difference holds for four of the colleges even in respect to recent graduates (of 1908 to 1912 inclusive) as well as for the graduates of 1912. The three highest failure percentages are for Meharry Medical College, 38.6 Memphis Hospital Medical College, 36.2, and the Chicago College of Medicine and Surgery, 19.3.

Of the 31 colleges having between 50 and 100 graduates examined, 12 had failure percentages of less than 10; 7 had failure percentages between 10 and 20, and 12 had failure percentages above 20, the 4 colleges having the highest failure percentages being Leonard School of Medicine, 57.1; Maryland Medical College, 56.8; Albany Medical College, 35.7, and Hahnemann Medical College, Chicago, 30.1.

The average percentage of failures for these larger colleges for graduates of 1907 and previous years was 23.0; for graduates of 1908 to 1912 inclusive (recent graduates), 15.9; for graduates of 1912, 12.1, and for graduates of all years, was 16.5. Of the 5,563 graduates of the 110 colleges in the United States which were examined by state boards in 1912 these larger schools furnished 3,924 or 70.5 per cent.

TABLE F.—COMPARISON OF RESULTS IN HOME STATES AND ELSEWHERE. BASED ON TABLE B.

College.	Total Examined.	Results in Home State. Passed.	Failed.	Per Cent. Failed.	Results in Other States. Passed.	Failed.	Per Cent. Failed.
ALABAMA —34.6	**96**	**41**	**31**	**42.9**	**22**	**2**	**8.3**
Birmingham Medical College	48	20	22	52.4	6	0	0.
University of Alabama	48	21	9	30.0	16	2	11.1
ARKANSAS +24.2	**63**	**39**	**11**	**22.0**	**7**	**6**	**46.2**
College of Physicians and Surgeons	7	1	2	66.7	2	2	50.0
University of Arkansas	56	38	9	19.1	5	4	44.4
CALIFORNIA —0.1	**119**	**98**	**11**	**10.1**	**9**	**1**	**10.0**
College of P. and S., Los Angeles	32	24	3	11.1	5	0	0.
College of P. and S., San Francisco	9	2	4	66.7	2	1	33.3
Cooper Medical College	33	30	2	6.2	1	0	0.
Hahnemann Med. Coll. of the Pacific	4	3	1	25.0	....	....	....
Oakland Coll. of Medicine and Surg	7	6	1	14.3	....	....	....
University of California	34	33	0	0.	1	0	0.
COLORADO +7.2	**44**	**30**	**0**	**0.**	**13**	**1**	**7.2**
University of Colorado	44	30	0	0.	13	1	7.2
CONNECTICUT +4.4	**28**	**17**	**1**	**5.6**	**9**	**1**	**10.0**
Yale Medical School	28	17	1	5.6	9	1	10.0
DISTRICT OF COLUMBIA +14.9	**109**	**39**	**4**	**9.3**	**50**	**16**	**24.2**
George Washington University	44	21	2	8.7	16	5	23.8
Georgetown University	24	13	2	13.3	7	2	22.2
Howard University	41	5	0	0.	27	9	25.0
GEORGIA +37.8	**192**	**129**	**2**	**1.5**	**37**	**24**	**39.3**
Atlanta College of Phys and Surgs	78	53	1	1.9	20	4	16.7
Atlanta School of Medicine	65	45	1	2.2	10	9	47.4
Georgia College of Eclectic M. and S	3	....	....	....	0	3	100.0
Southern Coll. of Medicine and Surg	5	....	....	....	3	2	40.0
Medical College of Georgia	41	31	0	0.	4	6	60.0
ILLINOIS —6.4	**783**	**420**	**85**	**16.8**	**249**	**29**	**10.4**
Bennett Medical College	93	49	14	22.2	22	8	26.7
Chicago College of Medicine and Surg	161	95	23	19.5	36	7	16.3
College of Physicians and Surgeons	194	111	25	18.4	50	8	13.8
Hahnemann Medical College and Hosp	47	17	11	39.3	17	2	10.5
Hering Medical College	9	2	2	50.0	4	1	20.0
Jenner Medical College	12	8	2	20.0	2	0	0.
Northwestern University Medical School	130	66	6	8.3	56	2	3.4
Rush Medical College	137	72	2	2.7	62	1	1.6
INDIANA +25.0	**50**	**46**	**0**	**0.**	**3**	**1**	**25.0**
Indiana University, School of Medicine	50	46	0	0.	3	1	25.0
IOWA +12.5	**62**	**54**	**0**	**0.**	**7**	**1**	**12.5**
Drake University, College of Medicine	19	16	0	0.	3	0	0.
State Univ. of Iowa, College of Med	39	34	0	0.	4	1	20.0
State Univ. of Iowa, Homeo. Dept	4	4	0	0.	....	....	....
KANSAS +23.6	**27**	**20**	**1**	**4.8**	**5**	**2**	**28.6**
Kansas Medical College	12	10	0	0.	2	0	0.
Univ. of Kansas, School of Medicine	15	10	1	9.1	3	1	25.0
KENTUCKY +20.1	**177**	**68**	**4**	**5.6**	**78**	**27**	**25.7**
University of Louisville, Medical Dept	177	68	4	5.6	78	27	25.7
LOUISIANA +10.5	**147**	**89**	**4**	**4.3**	**46**	**8**	**14.8**
Tulane University Medical Dept	147	89	4	4.3	46	8	14.8
MAINE —	**15**	**7**	**0**	**0.**	**8**	**0**	**0.**
Medical School of Maine	15	7	0	0.	8	0	0.
MARYLAND +3.4	**356**	**123**	**34**	**21.7**	**149**	**50**	**25.1**
Baltimore Medical College	42	16	2	11.1	18	6	25.0
College of Physicians and Surgeons	65	14	3	17.7	36	12	25.0
Johns Hopkins University	86	46	1	2.1	35	4	10.3
Maryland Medical College	78	11	22	66.7	22	23	51.1
University of Maryland	85	36	6	14.3	38	5	11.6
MASSACHUSETTS +8.9	**247**	**122**	**10**	**7.6**	**96**	**19**	**16.5**
Boston University	26	16	1	5.9	9	0	0.
College of Physicians and Surgeons	41	10	5	33.3	20	6	23.1
Harvard Medical School	73	29	2	6.5	35	7	16.7
Tufts College Medical School	107	67	2	2.9	32	6	15.8
MICHIGAN —	**151**	**130**	**0**	**0.**	**21**	**0**	**0.**
Detroit College of Medicine	39	38	0	0.	1	0	0.
Univ. of Michigan, Dept. of Med	93	76	0	0.	17	0	0.
Univ. of Michigan, Homeopathic Coll	19	16	0	0.	3	0	0.
MINNESOTA —	**39**	**29**	**0**	**0.**	**10**	**0**	**0.**
Univ. of Minn., Coll. of Med. and Surg	39	29	0	0.	10	0	0.
MISSOURI +12.9	**325**	**144**	**21**	**12.7**	**119**	**41**	**25.6**
American Medical College	57	23	8	25.8	17	9	34.6
Barnes Medical College	18	2	3	60.0	9	4	30.8
Eclectic Med. University, Kansas City	13	....	....	....	13	0	0.
Ensworth Medical College	12	3	2	40.0	2	5	71.4
Kansas City Hahnemann Med. Coll	14	2	0	0.	7	5	41.7
St. Louis University	88	55	0	0.	31	2	6.1
St. Louis College of Phys. and Surgs	27	2	3	60.0	9	13	59.1
University Medical Coll., Kansas City	39	18	5	21.8	14	2	12.5
Washington University	57	39	0	0.	17	1	5.6
NEBRASKA +1.7	**70**	**55**	**5**	**8.3**	**9**	**1**	**10.0**
John A. Creighton Medical College	51	40	4	9.1	7	0	0.
Lincoln Medical College	9	7	1	12.5	1	0	0.
University of Nebraska	10	8	0	0.	1	1	50.0
NEW HAMPSHIRE —16.7	**16**	**3**	**1**	**25.0**	**11**	**1**	**8.3**
Dartmouth Medical School	16	3	1	25.0	11	1	8.3
NEW YORK —16.3	**487**	**332**	**88**	**20.6**	**66**	**3**	**4.3**
Albany Medical College	54	30	20	40.0	4	0	0.
Columbia University, Coll. of P. and S.	88	64	8	11.1	15	1	6.3
Cornell University Medical School	31	22	0	0.	9	0	0.
Eclectic Medical College, New York	17	7	6	46.2	2	2	50.0
Fordham University	19	11	7	38.9	1	0	0.
Long Island College Hospital	86	61	17	21.8	8	0	0.
New York Homeo. Med. Coll. and Hosp.	30	13	5	27.8	12	0	0.
N. Y. Med. Coll. and Hosp. for Women	5	3	2	40.0	....	....	....
Syracuse University	25	20	5	20.0	....	....	....
Univ. and Bellevue Hosp. Med. Coll	88	70	6	7.9	12	0	0.
Univ. of Buffalo, Medical Dept	44	31	10	24.4	3	0	0.
NORTH CAROLINA +15.0	**81**	**28**	**17**	**37.8**	**17**	**19**	**52.8**
Leonard School of Medicine	54	8	12	60.0	16	18	52.9
North Carolina Medical College	27	20	5	20.0	1	1	50.0
OHIO +12.3	**222**	**178**	**9**	**4.8**	**29**	**6**	**17.1**
Cleveland College of Phys. and Surgs	20	18	0	0.	2	0	0.
Cleveland-Pulte Medical College	13	10	3	23.1	....	....	....
Eclectic Medical College	24	6	2	25.0	12	4	25.0
Ohio-Miami Medical College	60	47	2	4.1	9	2	18.2
Starling-Ohio Medical College	58	54	1	1.8	3	0	0.
Toledo Medical College	10	9	1	10.0	....	....	....
Western Reserve University	37	34	0	0.	3	0	0.
OKLAHOMA +40.0	**12**	**9**	**1**	**10.0**	**1**	**1**	**50.0**
Univ. of Oklahoma, School of Medicine	12	9	1	10.0	1	1	50.0
OREGON —50.0	**32**	**9**	**15**	**62.5**	**7**	**1**	**12.5**
Willamette University	10	1	8	88.9	1	0	0.
University of Oregon	22	8	7	46.7	6	1	14.3
PENNSYLVANIA —	**250**	....	....	....	**228**	**22**	**8.8**
Hahnemann Medical College and Hosp	15	....	....	....	14	1	6.7
Jefferson Medical College	97	....	....	....	92	5	5.2
Medico-Chirurgical Coll. of Phila	32	....	....	....	28	4	12.5
Temple University	4	....	....	....	4	0	0.
University of Pennsylvania	59	....	....	....	56	3	5.1
University of Pittsburgh	12	....	....	....	10	2	16.7
Woman's Med. Coll. of Pennsylvania	31	....	....	....	24	7	22.6
SOUTH CAROLINA —0.4	**81**	**57**	**13**	**18.6**	**9**	**2**	**18.2**
Med. Coll. of the State of So. Carolina	81	57	13	18.6	9	2	18.2
TENNESSEE +34.7	**415**	**118**	**10**	**7.8**	**165**	**122**	**42.5**
Memphis Hospital Medical College	153	36	2	5.3	60	55	47.8
Meharry Medical College	119	32	3	8.6	46	38	45.2
Lincoln Memorial Univ., Med. Dept	22	11	2	15.4	4	5	55.6
University of Tennessee	48	20	1	4.8	15	12	44.4
University of West Tennessee	18	4	2	33.3	4	8	66.7
Vanderbilt University	55	15	0	0.	36	4	10.0
TEXAS +15.6	**96**	**87**	**4**	**4.4**	**4**	**1**	**20.0**
Baylor University	17	15	2	11.8	....	....	....
Texas Christian University	17	13	1	7.2	2	1	33.3
Southern Methodist University	14	12	1	7.7	1	0	0.
University of Texas	48	47	0	0.	1	0	0.
VERMONT +16.2	**59**	**32**	**1**	**3.0**	**21**	**5**	**19.2**
University of Vermont	59	32	1	3.0	21	5	19.2
VIRGINIA +4.0	**113**	**63**	**7**	**10.0**	**37**	**6**	**14.0**
Medical College of Virginia	49	34	6	15.0	7	2	22.2
University of Virginia	24	8	0	0.	13	3	18.7
University College of Medicine	40	21	2	4.5	17	1	5.6
WISCONSIN +7.5	**72**	**42**	**7**	**14.3**	**18**	**5**	**21.8**
Marquette University	56	32	6	15.8	16	5	23.8
Wisconsin College of Phys. and Surgs	13	10	1	9.1	2	0	0.
Totals +8.4	5036	2658	395	12.9	1560	423	21.3

In this table the number of graduates examined in the state in which the college is located are grouped in one column while graduates of that college examined in other states are in another column. For example, under Tennessee, this table shows that, of the 153 graduates of Memphis Hospital Medical College examined by State Boards during 1912, 38 were examined in Tennessee of which number 36 passed and 2 or 5.3 per cent. failed, while 115 were examined in other states of which number 60 passed and 55 or 47.8 per cent. failed. This table shows that in the majority of instances the graduates have better chances of passing examinations in the state in which their colleges are located than they have elsewhere. This should always be considered in making comparison between colleges. A low standard college, by having all its graduates examined in the home state, may sometimes show a lower percentage of failures than a college of much higher grade which has graduates examined by several states. The reports from Pennsylvania were not received for publication, which prevents showing the results for the colleges of that state.

The heavy-faced figures give the results by states. The first column of heavy-faced figures preceded by the + and — signs, shows the differences between the percentages of examination in the home state and the examinations elsewhere. The plus sign indicates that graduates have better chances of success in the state where the colleges from which they graduated are located; the minus sign indicates that the chances are better elsewhere. The most marked variations in 1912 were in the examination of the graduates of the colleges of Oklahoma, 40.0 per cent.; Georgia, 37.8 per cent.; Tennessee, 34.7 per cent.; Indiana, 25.0 per cent., and Arkansas, 24.2 per cent., in all of which the chances of the graduates were better in the home state. The marked variations where the graduate's chances were better elsewhere were in Oregon, 50.0 per cent., and Alabama, 34.6 per cent. The danger of forming hasty conclusions from these percentages taken alone, however, is very well shown by the heavy figures for Indiana where there is one high grade school, where only 4 graduates were examined in "other states" and where the failure of one of them could have been accidental. The same is doubtless true regarding the percentages in Oklahoma where only two candidates were examined in "other states." More reliable are the percentages in Tennessee and Missouri where larger numbers from larger groups of colleges were examined in "other states." The totals show that on the average the chances of success were 8.4 per cent. better if the graduate took the examination in the state where his college was located.

Results in Home States and Elsewhere

Table F is of much interest, because it shows for each college the results of examinations in the state in which the college is located, as compared with the results of examinations in other states, where there is less possibility of local influence. Of all recent graduates examined in 1912, 3,053, or about 60 per cent., took their license examinations in the states in which the colleges from which they graduated were located. Of this number 12.9 per cent. failed on the average, whereas, of the 1,983 candidates examined in other states, 21.3 per cent. failed. This would indicate that, as a rule, the student's chances of passing the license examination are better if he stays in the college's home state. In this connection it is interesting to note that no graduate of any of the Iowa colleges failed in the Iowa examinations, although of the graduates of these colleges who were examined in other states, 12.5 per cent. failed. In Colorado there were no failures for the Colorado college, although of the graduates of that school examined elsewhere 7.2 per cent. failed. The student's chances for success at home and elsewhere were equal or nearly so in five instances, these being for the colleges of Maine, Michigan, Minnesota, Nebraska and South Carolina; the student's chances were better in the home state in twenty-two instances, while in six instances the student's chances were better if he went to some other state.

Total Results for Five Years

Table G shows, so far as reports were obtainable, the number registered and the number rejected in each state for each of the past five years. A comparison of this table with the statistics in the last educational number of THE JOURNAL (Aug. 24, 1912, p. 653, Table 12), shows what would be expected, that the states having the largest number of medical graduates examine the largest number of physicians. Now, only one state, New Mexico, will register candidates on presentation of diploma, without examination. This table shows only those registered by examination. Another table (K) shows the total registration by all methods.

Classification of Colleges

Tables H, I and J give a classification of the medical colleges of the United States on the basis of the failures of their graduates at state board examinations during the past year. This classification is based on the examination of *recent graduates*, as shown in Table B. In forming conclusions, the caution already given should be observed, of noting the number examined, the number of states in which representatives appeared, the character of the board making the examination and the character of the examination. To form a more exact judgment one should compare the percentage of failures received by any college this year with those received in the classifications published in previous years. The exact ratings of the Pennsylvania colleges in these lists are uncertain owing to the omission of the Pennsylvania report since naturally the largest numbers from those colleges were examined in that state. Careful investigation shows that a college cannot be considered a high-grade medical school merely because its graduates occasionally show a low percentage or an absence of failures at state board examinations. The fact is, several poorly equipped and low-standard colleges appear in the first list. On the other hand, some good schools appear in the second list. For the majority of colleges, however, the classification is fairly accurate. A comparison of this classification with that based on the actual inspection of the colleges by the Council on Medical Education will be of interest (see THE JOURNAL A. M. A., Jan. 18, 1913, pp. 231-234.)

Table H gives a list of forty-one colleges which obtained failure percentages below 10 per cent., fifteen of which had no failures whatsoever and nine others had only 5 per cent. or less. The failure percentage for the entire group was 4.2. Table I shows thirty-two colleges whose failure percentages were between 10 and 20 per cent., of which number seventeen had percentages below the average for the group.

TABLE G.—PHYSICIANS EXAMINED BY STATE BOARDS, 1908 TO 1912, INCLUSIVE

State.	1908		1909		1910		1911		1912		Totals.			
	Registered.	Rejected.	Registered.	Rejected.	Registered.	Rejected.	Registered.	Rejected.	Registered.	Rejected.	Examined.	Registered.	Rejected.	Percentage Rejected.
Alabama	66	66	7	20	94	64	107	54	84	72	634	358	276	43.5
Arizona	36	4	19	6	15	9	28	9	32	10	168	130	38	22.6
Arkansas	120	85	111	131	96	28	108	30	124	27	860	559	301	35.0
California	145	96	184	73	204	47	227	59	256	60	1351	1016	335	24.8
Colorado	52	14	36	15	48	5	33	8	41	1	253	210	43	17.0
Connecticut	67	16	52	13	69	18	73	20	70	18	416	331	85	20.5
Delaware	11	0	19	2	21	2	22	0	22	1	100	95	5	5.0
Dist. of Columbia	53	36	46	21	32	13	25	8	49	7	290	205	85	29.7
Florida	79	10	70	12	102	15	87	23	114	31	543	452	91	16.8
Georgia	150	14	143	28	148	9	148	28	178	17	863	767	96	11.1
Idaho	52	16	54	23	47	24	41	13	35	12	317	229	88	27.8
Illinois	646	96	645	117	631	100	432	154	505	134	3460	2859	601	28.5
Indiana	172	7	102	3	97	9	114	7	95	4	610	580	30	4.9
Iowa	139	43	98	14	113	4	75	6	131	7	630	556	74	11.7
Kansas	116	18	121	20	66	25	56	25	50	12	500	400	100	19.8
Kentucky	107	61	120	18	119	35	88	36	88	8	680	522	158	23.2
Louisiana	145	29	121	33	104	34	123	30	128	36	783	621	162	20.7
Maine	92	11	55	10	73	5	86	11	74	17	434	380	54	12.4
Maryland	132	71	130	33	131	32	160	39	160	46	934	713	221	23.7
Massachusetts*	238	108	213	95	197	100	226	74	227	54	1532	1101	431	28.1
Michigan	113	6	140	2	131	3	127	1	159	3	685	670	15	2.2
Minnesota	76	25	90	25	76	22	58	7	55	5	439	355	84	19.4
Mississippi*	138	184	130	154	84	150	115	113	56	48	1172	523	649	55.4
Missouri	181	50	212	70	181	23	182	38	213	32	1182	969	213	18.0
Montana	51	27	68	23	73	24	44	19	50	9	388	286	102	26.3
Nebraska	103	16	74	8	80	0	67	11	88	10	457	412	45	9.8
Nevada	17	0	9	0	12	1	8	1	8	1	57	54	3	5.4
New Hampshire	37	16	20	10	34	8	18	5	36	7	191	145	46	24.1
New Jersey	89	17	76	12	63	17	107	15	59	14	469	394	75	16.0
New Mexico	30	2	11	4	6	1	2	2	6	2	66	55	11	16.7
New York	679	73	566	72	515	72	536	164	433	153	3263	2729	534	16.4
North Carolina	95	26	111	18	79	15	92	30	87	37	590	464	126	21.4
North Dakota	52	10	41	6	42	5	25	1	15	7	204	175	29	14.2
Ohio	182	6	192	13	172	10	170	8	199	12	964	915	49	5.1
Oklahoma	34	10	92	44	100	42	123	39	94	27	605	443	162	26.8
Oregon*	43	63	95	50	93	55	94	50	96	65	704	421	283	40.2
Pennsylvania	485	49	474	27	451	52	515	27	...	...	2080	1925	155	7.5
Rhode Island	29	17	23	10	23	10	32	5	39	12	200	146	54	27.0
South Carolina	47	21	46	33	61	44	94	27	90	35	498	338	160	32.3
South Dakota	58	6	60	21	52	9	53	5	16	1	281	239	42	14.9
Tennessee*	213	87	277	4	315	52	213	42	313	76	1502	1331	261	16.4
Texas	143	23	181	19	162	5	151	19	151	13	807	788	79	9.1
Utah	27	5	28	4	34	4	22	3	20	2	149	131	18	12.1
Vermont	45	6	38	2	21	1	51	1	45	2	212	200	12	5.7
Virginia	128	53	136	40	122	14	115	43	105	30	786	606	180	24.0
Washington	182	60	148	49	154	43	102	43	69	27	877	655	222	25.3
West Virginia	102	18	105	10	88	25	88	22	66	20	544	449	95	17.5
Wisconsin	80	7	56	13	71	7	107	7	68	19	435	382	53	12.1
Wyoming	71	2	12	0	10	0	8	0	11	0	50	48	2	4.0
Totals	7770		7287		7004		6060		6353		35374			
Registered	6084		5857		5712		5578		5110		28341			
Rejected	1686		1430		1292		1382		1243		7033			
Per Cent. Rejected	21.7		19.6		18.4		19.9		17.8		19.9			

This table gives the number of candidates registered by examination by each state during each of the last five years, as well as the number rejected. The last four columns give the totals for the five years and the percentage rejected by each state.

Eight states registered over 1,000 candidates by examination in the five years, these being California, Illinois, Massachusetts, Mississippi, Missouri, New York, Pennsylvania and Tennessee. Over 3,000 were registered in Illinois and New York. Of the 1,351 candidates registered in Tennessee in the last five years, 525, or 39.4 per cent., were non-graduates.

The highest percentage of rejections were 55.4 in Mississippi, followed by Arkansas, Alabama and Oregon, with 43.5, 43.5 and 40.2, respectively. The states marked with an asterisk (*) included non-graduates among those examined, and for that reason would have higher percentages rejected. Such, however, was not the case in Tennessee. On the other hand, in several states the boards eliminate many candidates prior to the examination by a careful scrutiny of credentials and as a result there are lower percentages of failures at the examinations.

The lowest failure percentages were in Michigan, 2.2; Wyoming, 4.0; Indiana, 4.9; Delaware, 5.0; Ohio, 5.1; Nevada, 5.4, and Vermont, 5.7.

CLASSIFICATION OF COLLEGES
Comparison with Previous Years (Tables H, I, J).

	Colleges Having Less than 10 Per Cent.	Colleges Having 10 to 20 Per Cent.	Colleges Having Above 20 Per Cent.	Unclassified Colleges.	Total Colleges.
1904	47	27	38	37	149
1905	45	22	40	46	153
1906	62	24	43	20	149
1907	64	27	39	18	148
1908	48	29	46	15	138
1909	58	31	38	?	134
1910	57	22	42	0	121
1911	47	21	46	5	119
1912	41	32	37	0	110

which was 16.0. Table J includes thirty-seven colleges having failure percentages of 20 per cent. or above, of which number fifteen had below 30 per cent., eleven had between 30 and 40 per cent. and eleven had percentages above 40 per cent. The average percentage for all candidates in this group of colleges was 34.8.

A comparison of the classification this year with those of previous years shows a decrease in the number of colleges having above 20 per cent. of failures and also a decrease in those having less than 10 per cent. of failures. It will be interesting to note the changes in these totals hereafter as state boards more generally adopt the use of practical examinations.

TABLE H.—COLLEGES HAVING LESS THAN 10 PER CENT. OF FAILURES BEFORE STATE BOARDS IN 1912. BASED ON TABLE B.

College.	Total Examined.	Number Passed.	Number Failed.	Per Cent. Failed.	No. of States.
CALIFORNIA					
College of Phys. and Surgs., Los Angeles	32	29	3	9.4	6
Cooper Medical College	33	31	2	6.1	2
University of California, Medical Dept.	34	34	0	0.	2
COLORADO					
University of Colorado, Medical Dept.	44	43	1	2.3	10
CONNECTICUT					
Yale Medical College	28	26	2	7.1	5
GEORGIA					
Atlanta College of Physicians and Surgs.	78	73	5	6.4	7
ILLINOIS					
Northwestern University Medical School	130	122	8	6.2	20
Rush Medical College	137	134	3	2.2	21
INDIANA					
Indiana University, School of Medicine	50	49	1	2.0	5
IOWA					
Drake University, College of Medicine	19	19	0	0.	4
State University of Iowa, College of Med.	39	38	1	2.6	5
State University of Iowa, Homeo. Dept.	4	4	0	0.	1
KANSAS					
Kansas Medical College	12	12	0	0.	3
LOUISIANA					
Tulane University, Medical Dept.	147	135	12	8.2	12
MAINE					
Medical School of Maine	15	15	0	0.	4
MARYLAND					
Johns Hopkins University, Medical Dept.	86	81	5	5.8	15
MASSACHUSETTS					
Boston University, School of Medicine	26	25	1	3.8	6
Tufts College Medical School	107	99	8	7.5	7
MICHIGAN					
Detroit College of Medicine	39	39	0	0.	2
Univ. of Mich., Dept. of Med. and Surg.	93	93	0	0.	11
University of Michigan, Homeo. College	19	19	0	0.	3
MINNESOTA					
Univ. of Minn., Coll. of Med. and Surg.	39	39	0	0.	5
MISSOURI					
Eclectic Medical University, Kansas City	13	13	0	0.	1
St. Louis University, School of Medicine	88	86	2	2.3	15
Washington University, Medical Dept.	57	56	1	1.8	11
NEBRASKA					
John A. Creighton Medical College	51	47	4	7.8	7
NEW YORK					
Cornell University Medical College	31	31	0	0.	7
Univ. and Bellevue Hosp. and Med. Coll.	88	82	6	6.8	7
OHIO					
Cleveland College of Physicians and Surgs.	20	20	0	0.	3
Ohio-Miami Medical College	60	56	4	6.7	10
Starling-Ohio Medical College	58	57	1	1.7	3
Western Reserve University, Medical Dept.	37	37	0	0.	3
PENNSYLVANIA*					
Hahnemann Medical College and Hospital	15	14	1	6.7	8
Jefferson Medical College	97	92	5	5.2	31
Temple University, Medical Dept.	4	4	0	0.	2
University of Pennsylvania, Dept. of Med.	59	56	3	5.1	24
TENNESSEE					
Vanderbilt University, Medical Dept.	55	51	4	7.3	18
TEXAS					
Southern Methodist University, Med. Dept.	14	13	1	7.2	2
University of Texas, Dept. of Medicine	48	48	0	0.	2
VIRGINIA					
University College of Medicine	40	38	2	5.0	8
WISCONSIN					
Wisconsin College of Physicians and Surgs.	13	12	1	7.7	3
Totals	2059	1972	87	4.2	

* Ratings of Pennsylvania colleges uncertain owing to omission of Pennsylvania report.

TABLE I.—COLLEGES HAVING BETWEEN 10 AND 20 PER CENT. OF FAILURES BEFORE STATE BOARDS IN 1912. BASED ON TABLE B.

College.	Total Examined.	Number Passed.	Number Failed.	Per Cent. Failed.	No. of States.
CALIFORNIA					
Oakland College of Medicine and Surgery	7	6	1	14.3	1
DISTRICT OF COLUMBIA					
George Washington University	44	37	7	15.9	14
Georgetown University, School of Medicine	24	20	4	16.7	7
GEORGIA					
Atlanta School of Medicine	65	55	10	15.4	9
Medical College of Georgia	41	35	6	14.6	4
ILLINOIS					
Chicago College of Medicine and Surgery	161	131	30	18.6	22
College of Physicians and Surgeons	194	161	33	17.0	17
Jenner Medical College	12	10	2	16.7	3
KANSAS					
University of Kansas, School of Medicine	15	13	2	13.3	4
KENTUCKY					
University of Louisville, Medical Dept.	177	146	31	17.5	21
MARYLAND					
Baltimore Medical College	42	34	8	19.0	13
University of Maryland, School of Medicine	85	74	11	12.9	16
MASSACHUSETTS					
Harvard Medical School	73	64	9	12.3	18
MISSOURI					
University Medical College, Kansas City	39	32	7	18.0	7
NEBRASKA					
Lincoln Medical College	9	8	1	11.1	2
University of Nebraska, College of Medicine	10	9	1	10.0	3
NEW HAMPSHIRE					
Dartmouth Medical School	16	14	2	12.5	6
NEW YORK					
Columbia Univ., Coll. of Phys. and Surgs.	88	79	9	10.2	13
Long Island College Hospital	86	69	17	19.8	5
New York Homeo. Medical Coll. and Hosp.	30	25	5	16.7	7
Syracuse University, College of Medicine	25	20	5	20.0	1
OHIO					
Toledo Medical College	10	9	1	10.0	1
OKLAHOMA					
University of Oklahoma, School of Med.	12	10	2	16.7	3
PENNSYLVANIA					
Medico-Chirurgical College of Philadelphia	32	28	4	12.5	14
University of Pittsburgh, School of Med.	12	10	2	16.7	9
SOUTH CAROLINA					
Med. Coll. of the State of South Carolina	81	66	15	18.5	6
TEXAS					
Baylor University, College of Medicine	17	15	2	11.8	1
Texas Christian University, Medical Dept.	17	15	2	11.8	3
VERMONT					
University of Vermont, College of Medicine	59	53	6	10.2	8
VIRGINIA					
Medical College of Virginia	49	41	8	16.3	5
University of Virginia, Dept. of Medicine	24	21	3	12.5	11
WISCONSIN					
Marquette University, Medical Dept.	59	48	11	18.6	9
Totals	1615	1358	257	16.0	

TOTAL REGISTRATION IN 1912

The tables thus far described have referred only to the results of examinations and to those registered on that basis. Table K, however, shows the total number who received licenses in each state, including those registered by examination, by reciprocity and under various exemption clauses. Above 100 were registered in twenty-seven different states, above 200 in eleven and above 300 in four, the largest numbers being registered in Illinois with 546, New York with 480, Pennsylvania with 369 and Tennessee with 323. There were 165 non-graduates registered in five states, 142 (86 per cent.) having been registered in Tennessee, thirteen in Massachusetts, eight in Oregon, one in Colorado and one in Maine. Altogether, 6,723 physicians were licensed during 1912 as compared with 6,824 in 1911, 7,352 in 1910 and 7,865 in 1906.

Table L gives those registered without examination on presentation of satisfactory credentials, which included a license issued by some other state. This is usually described by the term "reciprocity," which conveys the idea that the state which accepts the license of another must be granted the same courtesy by the state issuing the original license. The term does not well describe this method of registration, however, since some state boards consider it more fair to the physician to accept his credentials, if satisfactory, whether the state board issuing the original license returns the favor or not. Had not reciprocal relations been established by the thirty-four states shown in the table, 1,141 physicians, the majority of whom have been in practice for many years, would have been compelled to undergo the ordeal of a second trying examination.

Reciprocity and Educational Standards

As at present administered, reciprocal relations between some states are tending to lower rather than to elevate educational standards. A study of these statistics will show that in several instances such relations exist between states differing widely in their standards of education and in the methods and severity of their examinations. It can be seen, therefore, that a loosely administered provision for reciprocity provides a wide-open door through which unqualified candidates can obtain registration. There are some boards, however, which wisely reserve and exercise the right to reject any candidate who does not possess satisfactory credentials even though he is licensed in a state with which it has reciprocal relations. Some boards also prudently require that the applicant, before he is eligible to registration through reciprocity, must have been engaged in the actual and reputable practice of his profession for at least a year in the state where the original license was granted. Without this provision a candidate may be tempted to obtain his original license in the state giving the easiest examination. Without the one-year-residence clause, therefore, standards of examination are apt to be lowered. In the establishing of reciprocal relations the state board should reserve and exercise the discretionary power to refuse to register any candidate who could not originally have registered in that state, and, secondly, the board should require that the applicant shall have been in the actual practice of medicine for at least a year before he is eligible to registration under the reciprocity provision.

Table J.—Colleges Having Over 20 Per Cent. of Failures Before State Boards in 1912. Based on Table B.

College.	Total Examined.	Number Passed.	Number Failed.	Per Cent. Failed.	No. of States.
ALABAMA					
Birmingham Medical College	48	26	22	45.8	4
University of Alabama, Medical Dept.	48	37	11	22.9	5
ARKANSAS					
College of Physicians and Surgeons	7	3	4	57.1	3
University of Arkansas, Medical Dept.	56	43	13	23.2	5
CALIFORNIA					
College of Phys. and Surgs., San Francisco	9	4	5	55.6	3
Hahnemann Medical College of the Pacific	4	3	1	25.0	1
DISTRICT OF COLUMBIA					
Howard University, Medical Dept.	41	32	9	22.0	13
GEORGIA					
Georgia Coll. of Eclectic Med. and Surg.	3	0	3	100.0	2
Southern College of Medicine and Surgery	5	3	2	40.0	2
ILLINOIS					
Bennett Medical College	93	71	22	23.7	14
Hahnemann Medical College and Hospital	47	34	13	27.7	12
Hering Medical College	9	6	3	33.3	6
MARYLAND					
College of Physicians and Surgeons	65	50	15	23.1	14
Maryland Medical College	78	33	45	57.7	12
MASSACHUSETTS					
College of Physicians and Surgeons	41	30	11	26.9	10
MISSOURI					
American Medical College	57	40	17	29.8	6
Barnes Medical College	18	11	7	38.9	8
Ensworth Medical College	12	5	7	58.3	5
Kansas City Hahnemann Medical College	14	9	5	35.7	5
St. Louis College of Physicians and Surgs.	27	11	16	59.2	12
NEW YORK					
Albany Medical College	54	34	20	37.0	4
Eclectic Med. Coll. of the City of New York	17	9	8	47.1	4
Fordham University, School of Medicine	19	12	7	36.8	2
New York Med. Coll. and Hosp. for Women	5	3	2	40.0	1
University of Buffalo, Medical Dept.	44	34	10	22.7	4
NORTH CAROLINA					
Leonard School of Medicine	54	24	30	55.6	8
North Carolina Medical College	27	21	6	22.2	3
OHIO					
Cleveland-Pulte Medical College	13	10	3	23.1	1
Eclectic Medical College	24	18	6	25.0	9
OREGON					
Willamette University, Medical Dept.	10	2	8	80.0	2
University of Oregon, Medical Dept.	22	14	8	36.4	3
PENNSYLVANIA					
Woman's Medical College of Pennsylvania	31	24	7	22.6	17
TENNESSEE					
Memphis Medical College	153	96	57	37.3	12
Meharry Medical College	119	78	41	34.5	18
Lincoln Memorial University, Medical Dept.	22	15	7	31.8	8
University of Tennessee, Medical Dept.	48	35	13	27.1	14
University of West Tennessee, Medical Dept.	18	8	10	55.6	6
Totals	1362	888	474	34.8	

In the light of the above statement in regard to reciprocity, it will be interesting to study Table M, which shows in what states the original licenses were granted of those who were registered elsewhere under the reciprocity provision during the last five years. Note that of the 6,029 physicians licensed through reciprocity during the last five years the original licenses of 1,260 (20.9 per cent.) were obtained in Illinois, more than twice as many as came from any other one state. In New York 471 physicians took their original license examinations, 376 in Iowa and 336 in Missouri.

In Conclusion

In the publication of these statistics, the endeavor has been to give an absolutely fair presentation of facts, a knowledge of which is always beneficial. Without question this annual presentation of the results of state licensing examinations has had a most helpful influence on medical education and medical licensure in this country. We reiterate our acknowledgments to the state licensing boards whose ready cooperation and complete reports have made the publication of these data possible.

TABLE K.—Registration by State Boards During the Year 1912.

States.	By Examination.			By Reciprocity.	Without Written Exam. or Under Exemption.	Total Registered
	Graduates, 1908-1912.	Graduates, 1907 and Previous.	Non-graduates.			
Alabama	79	5	....	....	....	84
Arizona	10	22	....	....	2	34
Arkansas	105	19	....	27	....	151
California	159	97	....	....	12	268
Colorado	37	3	1	80	....	121
Connecticut	58	12	....	3	....	73
Delaware	18	4	....	11	....	33
District of Columbia	46	3	....	4	....	53
Florida	82	32	....	....	....	114
Georgia	168	10	....	34	....	212
Idaho	17	18	....	....	....	35
Illinois	474	31	....	41	....	546
Indiana	90	5	....	28	....	123
Iowa	124	7	....	37	....	168
Kansas	45	5	....	52	....	102
Kentucky	86	2	....	30	5	123
Louisiana	122	6	....	1	....	129
Maine	64	9	1	6	....	80
Maryland	153	7	....	19	....	179
Massachusetts	191	23	13	....	....	227
Michigan	152	7	....	60	....	219
Minnesota	47	8	....	59	....	114
Mississippi	53	3	....	2	....	58
Missouri	177	36	....	67	....	280
Montana	35	15	....	....	....	50
Nebraska	76	12	....	59	....	147
Nevada	3	5	....	13	....	21
New Hampshire	28	8	....	8	....	44
New Jersey	54	5	....	74	....	133
New Mexico	2	4	....	....	92	98
New York	406	27	....	43	4	480
North Carolina	81	6	....	22	....	109
North Dakota	10	5	....	11	1	27
Ohio	197	2	....	64	....	263
Oklahoma	70	24	....	17	....	111
Oregon	52	36	8	....	....	96
Pennsylvania	353	3	....	13	....	369
Rhode Island	33	6	....	....	....	39
South Carolina	88	2	....	2	....	92
South Dakota	12	4	....	1	....	17
Tennessee	162	9	142	10	....	323
Texas	136	15	....	99	....	250
Utah	16	4	....	7	....	27
Vermont	41	4	....	2	....	47
Virginia	103	2	....	29	....	134
Washington	51	18	....	....	....	69
West Virginia	58	8	....	28	....	94
Wisconsin	65	3	....	57	....	125
Wyoming	6	5	....	21	....	32
Totals	4095	696	165	1141	116	6723

This table shows the total number registered during 1912 in each state by the various methods. The first column shows the recent graduates registered, the second column, the old practitioners (graduates of 1907 and previous years), the third column the non-graduates, and the fourth column shows the number licensed through reciprocity. It is interesting to note that states which have registered large numbers through reciprocity have examined very few old practitioners. The chief exception is New York, which has arranged reciprocal relations with only seven other states. The fifth column shows those registered without written examination under various exemption clauses. The last column shows the total number of physicians registered by all methods in each state during the year.

TABLE L.—PHYSICIANS REGISTERED THROUGH RECIPROCITY BY STATE EXAMINING BOARDS DURING 1912

State Boards of	Total Reg. by Recip., f.a. State	Alabama	Arkansas	Colorado	Connecticut	Delaware	Dist. of Col.	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Pennsylvania	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska	U. S. Army	Foreign
Arkansas	27	..	..	..	..	..	1	..	..	..	5	1	..	..	7	2	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	8	..	1	1	..	..	..	..	..	..	..
Colorado	80	1	..	1	..	1	..	..	2	13	2	6	2	2	2	1	1	2	..	3	2	2	5	..	4	..	..	..	2	4	..	1	4	6	..	..	4	2	..	2	..	..	1	2	1	1	..	..
Connecticut	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Delaware	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	1	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
District of Columbia	4	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Georgia	34	..	..	..	..	..	1	1	..	..	..	..	1	1	..	3	..	4	..	4	..	..	2	..	1	..	..	..	..	3	..	..	..	..	..	..	..	..	9	..	..	..	3	..	1	..	..	..	..
Illinois	41	..	..	..	..	..	..	..	..	..	..	4	3	2	2	1	2	3	..	6	2	..	9	..	1	..	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
Indiana	28	..	..	..	..	..	3	..	..	..	6	..	..	1	2	..	..	2	..	2	1	..	1	..	..	..	..	..	..	1	..	..	2	..	2	..	..	..	2	..	..	..	1	..	1	..	1	..	..
Iowa	37	..	..	1	..	..	..	..	1	..	8	1	..	2	..	..	1	..	..	1	1	..	9	..	4	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Kansas	52	..	..	1	..	..	..	..	..	..	11	4	4	..	..	..	..	..	..	3	1	..	15	..	5	..	..	..	..	..	..	..	1	..	..	..	..	..	3	1	..	..	..	1	..	..	..	..	..
Kentucky	30	..	..	..	..	..	..	..	1	..	..	4	..	..	..	..	..	..	..	2	1	1	1	..	..	..	..	..	2	..	1	..	2	..	..	..	..	..	9	1	..	..	1	..	3	..	..	..	1
Louisiana	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Maine	6	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..
Maryland	19	..	..	..	..	2	..	..	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	3	..	..	..	3	..	1	..	3	..	..	5	..	..	..	..
Michigan	60	..	1	3	..	..	..	..	..	..	23	3	2	..	..	..	..	3	..	..	2	..	3	..	..	..	..	..	..	3	..	..	6	1	..	..	..	..	1	..	..	1	..	1	..	6	..	..	1
Minnesota	59	..	..	1	..	..	1	..	..	..	22	1	4	..	1	..	1	..	..	4	..	..	1	2	..	..	..	..	..	..	5	2	..	..	1	..	..	..	..	..	..	..	..	..	..	13	..	..	..
Mississippi	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Missouri	67	..	..	..	..	..	1	..	1	..	12	5	10	8	3	..	1	5	..	1	1	..	..	..	5	..	..	..	..	..	..	..	7	..	..	..	..	..	..	3	..	..	2	..	2	..	..	..	..
Nebraska	59	..	1	..	..	..	1	..	1	..	9	1	14	6	2	..	4	1	..	3	1	..	6	..	..	..	..	..	..	..	..	..	1	2	..	..	1	3	1	1	..	..	..	..	..	..	..	..
Nevada	13	..	..	..	..	..	..	..	..	..	3	1	1	..	1	..	2	..	..	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
New Hampshire	8	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	3	..	..	..	..	1	..	..	..	..	..	..
New Jersey	74	..	..	..	..	..	..	..	..	..	1	..	..	..	2	1	8	..	..	..	1	..	..	..	..	..	..	..	1	..	33	..	1	29	..	..	..	..	7	..	..	..	..	..	..	..	..	..	..
New York	43	..	..	..	..	11	..	..	..	..	..	1	..	..	..	..	..	..	1	11	..	..	..	..	..	..	..	..	10	..	..	..	2	..	..	..	..	..	7	..	..	..	..	..	..	..	..	..	..
North Carolina	22	..	..	..	..	1	3	..	3	..	1	..	..	..	..	..	..	2	1	..	..	1	..	..	..	..	..	..	1	..	1	..	1	1	1	1	..	2	..	..	..	1	1	..	..	..	..	..	..
North Dakota	11	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
Ohio	64	..	1	..	..	..	..	..	..	..	11	6	1	..	6	..	..	4	..	12	1	..	4	..	..	..	..	..	..	10	..	..	..	1	..	..	..	..	1	..	..	4	2	..	..	..	..	..	..
Oklahoma	17	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	6	..	..	..	3	..	..	..	..	..	..
Pennsylvania	13	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	7	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Carolina	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
South Dakota	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tennessee	10	..	..	..	..	..	..	5	..	..	..	1	..	..	1	..	..	1	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Texas	99	..	11	..	..	..	..	..	1	17	3	4	4	1	..	1	1	..	3	3	..	8	1	2	2	..	..	..	..	..	..	2	7	20	2	..	..	2	..	..	..	..	3	1	..	..	..	..
Utah	7	..	..	1	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Vermont	2	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Virginia	29	..	..	..	..	..	1	..	..	..	1	..	2	..	1	..	..	6	..	1	..	..	..	..	..	..	..	..	..	2	4	..	..	1	..	..	..	..	3	..	..	..	1	6	..	..	..	..	..
West Virginia	28	..	..	..	..	..	3	..	..	..	1	1	..	..	3	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	..	12	..	..	..	..	..	..
Wisconsin	57	..	1	..	..	..	..	..	..	..	34	1	4	..	..	..	..	3	..	..	2	5	..	..	..	..	..	..	..	..	..	..	3	1	..	..	..	..	1	..	..	1	1	..	..	..	..	..	..
Wyoming	21	..	..	2	..	..	..	..	..	..	8	..	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	2	2	..	..	..	1	..	..	..	..
Total	1141	1	15	9	1	15	18	1	13	5	193	40	58	27	36	16	23	48	2	59	29	5	67	1	29	3	1	18	4	46	12	12	39	28	57	5	1	51	24	3	30	25	3	29	35	4	1	2	5
Number	....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

This table shows the number of physicians registered by each state through reciprocity during 1912. Reciprocity is not the best term to use, however, since some states, Colorado for instance, register candidates who have satisfactory credentials including licenses, regardless as to whether the state issuing the original license reciprocate with them or not. Taking New York as an example, reading from left to right, the table shows that New York registered a total of 43 applicants through reciprocity during 1912, of which number 11 came from Delaware, 1 from Indiana, 1 from Massachusetts, 11 from Michigan, 10 from New Jersey, 2 from Ohio, and 7 from Vermont. Reading from above downward, the table shows that 46 physicians left New York during 1912 and registered in other states under the reciprocity provision, of which number 4 registered in Colorado, 1 in Connecticut, 1 in Delaware, 1 in Maine, 3 in Michigan, 23 in New Jersey, 1 in North Carolina, 10 in Ohio, and 2 in Virginia. Texas leads, having registered 99 physicians through reciprocity, followed by Colorado which registered 80, New Jersey with 74, Missouri with 67 and Ohio with 64. It is interesting to note in what states the original licenses were issued. The table shows that of the 1,141 applicants registered through reciprocity 193, or 17.0 per cent., obtained their original licenses in Illinois and 67, the next largest number, were first registered in Missouri. The states which furnished the next highest numbers were Michigan with 59, Iowa with 58, Pennsylvania with 57, Tennessee with 51 and Maryland with 48.

TABLE M.—RECIPROCAL REGISTRATION IN FIVE YEARS
Showing What States Issued the Original Licenses.

State.	Physicians Going from States Named During					Totals.
	1908	1909	1910	1911	1912	
Alabama	4	2	..	3	1	10
Arizona*	1	2	..	..	..	3
Arkansas	..	1	52	11	15	79
California*	2	1	2	1	..	6
Colorado	10	12	13	16	9	60
Connecticut*	2	2	..	..	1	5
Delaware	2	1	6	9	15	33
District of Columbia	14	13	11	23	18	79
Florida*	..	1	1	..	1	3
Georgia	18	10	14	7	13	62
Idaho*	1	1	..	..	5	7
Illinois	225	320	286	236	193	1260
Indiana	53	46	50	37	40	206
Iowa	94	77	84	63	58	376
Kansas	32	41	63	50	27	213
Kentucky	53	30	74	42	36	235
Louisiana	..	2	9	8	10	29
Maine	24	18	15	14	23	94
Maryland	30	25	41	52	48	196
Massachusetts*	3	3	..	2	2	10
Michigan	63	51	51	69	59	293
Minnesota	23	35	31	29	29	147
Mississippi	1	1	1	3	5	11
Missouri	61	58	91	59	67	336
Montana*	..	..	3	..	1	4
Nebraska	47	53	42	46	29	217
Nevada	4	2	3	2	3	14
New Hampshire	2	8	1	6	1	18

State.	Physicians Going from States Named During					Totals.
	1908	1909	1910	1911	1912	
New Jersey	46	29	16	14	18	123
New Mexico*	1	7	1	1	4	14
New York	100	59	224	42	46	471
North Carolina	4	7	7	16	12	46
North Dakota	6	5	8	7	12	38
Ohio	35	47	45	40	39	206
Oklahoma	3	5	21	3	28	60
Oregon*	1	..	..	..	..	1
Pennsylvania	15	7	21	12	57	112
Rhode Island*	1	1	..	..	..	2
South Carolina	4	7	5	4	5	25
South Dakota	1	1	..	2	1	5
Tennessee	14	21	45	28	51	159
Texas	10	4	23	10	24	71
Utah	3	4	1	2	3	13
Vermont	20	24	27	26	30	137
Virginia	15	26	31	28	25	125
Washington*	..	..	2	7	3	12
West Virginia	21	36	45	45	29	176
Wisconsin	42	46	31	41	35	195
Wyoming	..	2	1	2	4	9
Alaska	..	..	..	..	1	1
U. S. Army	..	3	..	..	2	5
U. S. P. H. Service	..	..	2	..	..	2
Canada	..	..	2	..	..	2
Foreign and Misc.	..	10	..	..	3	13
Totals	1091	1167	1502	1128	1141	6029

This table shows that 6,029 candidates were registered through reciprocity during the last five years and that until 1911 there was a positive increase each year over the registration of the previous year. A study of the totals for the different states shows that of the 6,029 registered during the four years 1,260 or 20.9 per cent. obtained their original licenses in Illinois. This is more than twice the number coming from any other state. The states furnishing the next highest numbers are New York, with 471, Iowa with 376, and Missouri with 336. The states marked with an asterisk (*) do not have reciprocal relations and would not appear in this table except for the fact that some states, like Colorado and New Jersey, will accept a physician's credentials if satisfactory, whether the state issuing his original license returns the favor or not.

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SATURDAY, MAY 24, 1913

STATISTICS OF STATE BOARD EXAMINATIONS

We present this week, for the tenth consecutive year, tabulated statistics based on examinations conducted by state medical licensing boards. Never before have we had such ready cooperation on the part of state licensing boards, the officers of which have long since come to appreciate the value of these statistics. In 1903, when the collecting of these data began, reports from a large number of boards could not be secured for the reason that no permanent records of the examinations had been kept.

As the casual reader glances over the tables, he will probably not appreciate the enormous amount of work that it entails, or the labor required during the year to gather the material for these tables. Furthermore, the casual reader will not appreciate the conditions which make the collection of these data so important. Matters relating to medical education and medical licensure in this country are controlled by the forty-nine individual states, no two of which entirely agree in details, each state conducting its affairs with little regard as to what is done in other states. No provision has been made by the national government for any coordination or cooperation in these matters, although there is a serious necessity for such coordination. As a matter of fact, it should not be necessary for a voluntary organization to do this work. It should be the function of the national government. The lack of coordination among the various states in these matters is quite serious, as shown by the fact that if an incompetent doctor or an impostor has had his license refused or revoked in one state, he goes promptly to another state, where he seldom fails to secure a license. If he is caught again, he as promptly transfers his allegiance to a third state. Aside from the attempt of a few state boards to work together in a federation, the only influence tending to bring about uniformity in education standards and methods of licensure is that being exerted by the American Medical Association. If, as intimated above, there were a national control of the licensing of physicians in the United States, such as exists in practically every other country, it would not be necessary for the American Medical Association to do this work.

The various statistical tables are worth careful attention. A few additional comments are worth while, and the reader is urged to make a further study by referring to the tables and the descriptive matter accompanying them.

FACTS REGARDING EACH STATE

These tables give valuable information regarding medical licensure in each state. For example, Tables A and B show the number of candidates who appeared for examination, the colleges from which they graduated, the number from each college who passed and the number from each who failed, the total number registered, the total number rejected and the percentage of candidates rejected. This table allows of comparison between the totals and the percentages of one state and those of other states. If a state board's examinations are unusually lenient for graduates of medical schools located in that state as compared with the results for graduates from colleges in other states, the fact will be shown in Table F. The total number of candidates examined, registered and rejected in the last five years by each board and the percentage of rejections are shown in Table G. This permits comparison not only of the figures of the last year with those of the four previous years, but also of the figures of one state with those of the others. Table K shows for each state the totals registered by all methods, by examination, by reciprocity and under exemption clauses. This table also shows the number of non-graduates licensed. Table L shows the number of candidates licensed by each state through reciprocity and shows in what states the original licenses were granted. Table M shows the total number of physicians from each state who, during the last five years, secured licenses elsewhere through reciprocity.

FACTS REGARDING EACH COLLEGE

The tables also give much information regarding medical colleges. For example, Tables A and B show in what state graduates of each college were examined; they show the number who passed and the number who failed in each state, the total examined in all states, the number who passed, the number who failed, the percentage of failures and the number of states in which graduates of the college appeared for examination. In fact, Tables A, B and C permit a comparative study of medical colleges of much value in connection with any investigation of medical colleges. Table D shows for the group of colleges located in each state the total number of graduates examined in all states, the percentage of failures and the rank of each group according (1) to the number examined and (2) to the success of the graduates at the examinations. Table E furnishes an interesting study of the larger colleges—those having fifty or more graduates examined during the year—and allows of comparison between colleges of nearly equal size. The mere fact that a college has large classes is no indication that it furnishes a better medical training. In fact, these data show that often the contrary is true. Tables H, I and J

give a classification of medical colleges based on the failures of their graduates at state board examinations. This classification should not be taken alone in forming conclusions regarding medical colleges. Occasionally low-grade colleges may have less than 10 per cent. of failures, owing probably to the fact that only a few graduates were examined, or that they were all examined in the home state. On the other hand, well-equipped and fairly good colleges may occasionally have between 10 and 20 per cent. of failures, especially if they are in states having more rigid examinations. It is seldom, however, that a well-equipped and well-conducted medical college will, year after year, receive more than 20 per cent. of failures of its graduates at state licensing examinations. This classification of colleges is interesting, however, and throws an important side-light on the third classification[1] of the medical colleges of the United States prepared by the Council on Medical Education following the actual inspection of the colleges.

TOTAL REGISTRATION IN ALL STATES

These statistics show for each state the number of candidates coming not only from each medical school in this country but also from Canadian and other foreign medical colleges. In short, they give an accurate record of the number and source of those who are entering the practice of medicine each year in this country. Without the data published this week, it could not be known that 6,723 physicians were licensed in this country during 1912, and that this included 5,466 who were registered by examination, 116 who were registered under the various exemption clauses, and 1,141 mostly old practitioners, who were registered under the provision for reciprocity.

STATISTICS ACCURATE AND RELIABLE

The work of collecting and publishing these statistics was begun by THE JOURNAL in 1903, but since the creation of the Council on Medical Education they have been developed as an important part of the Council's work. Every report received from the state licensing boards is now carefully checked, duplications are avoided, errors are corrected and the statistics are thereby rendered accurate and reliable. This is made possible through the enormous amount of data collected by the Council regarding medical colleges, students and graduates. Through the possession by the Council of complete alumni lists of all existing medical colleges, the Council is in position to avoid charging a college with a failure which may have been erroneously accredited to it when, in fact, the candidate who failed was a graduate of some other college.

INFLUENCE ON MEDICAL LICENSURE

These statistics have had a much greater effect, however, than that rendered by a mere numerical record of physicians examined and licensed, and probably no one has recognized their value more than have the state licensing boards themselves. As a result, in many states splendid systems of record-keeping are now to be found where formerly, in several states at least, no records whatever were kept, and in several other states the systems were far from perfect. During the last several years, furthermore, they have furnished abundant argument for practical tests in state license examinations and have undoubtedly had much to do with the improved character of these examinations and the better methods of conducting them. A study of the statistics for several years will show that, although there has been a gradual improvement, there is still much that needs to be done.

INFLUENCE ON MEDICAL COLLEGES

The influence on medical colleges resulting from the publication of these statistics has been tremendous. Whereas previously these institutions may have been unaware of the weaknesses in their methods of teaching, these statistics have shown them how frequently their graduates fail at the state license examinations. There has been a marked improvement in their equipment, better teachers have been secured and better methods adopted, and it can be seen by a review of the statistics published during the last several years that a number of colleges have materially reduced the failure percentages of their graduates at these examinations.

COOPERATION MUTUALLY ADVANTAGEOUS

As will be understood by the careful reader, these statistics have their greatest value when studied in connection with other data collected by the Council on Medical Education and published in THE JOURNAL and in the Council's reports. The state board statistics are made more accurate and reliable through the data kindly furnished by medical colleges; they are based on reports received direct from state boards; but through the careful checking of those reports, errors are frequently corrected, the state boards are notified, and in this way state records are also made more accurate. The statistics published this week, therefore, have been made possible only through the cordial cooperation of both the state boards and medical colleges, and for this cooperation we again express our acknowledgments.

1. THE JOURNAL A. M. A., Jan. 18, 1913, p. 231.

UNINTENTIONAL HUMOR IN SCIENCE

The following absurdity appeared, not in the Sunday edition of a "yellow" journal or in the columns of a humorous weekly, but in the March issue of a dignified scientific journal, well seasoned by sixty-eight years of useful existence—the *Chemical News* of London:

"Rewrite your works on foods, Mr. Langworthy and Dr. Wiley! Begin anew your nutrient studies, Uncle Sam, and you dietetic experts in college, state departments of agriculture, food commission and government, state and city laboratories, for all your labor has been for nothing. You have reckoned on a wrong basis. Your premises being wrong, your conclusions are wrong. You might as well admit now as later that you know noth-

ing at all about the nutritive properties of foods, for that is just what it amounts to in the light of the latest revelation. And this is not said in sarcasm either. . . . As Newton overturned old traditions by revealing the law of gravitation; as radio-activity has upset all previous calculations concerning the make-up of matter, so has Trophogen or Bitrophon set at naught all our former reckonings regarding the nutritive power of foods."[1]

When an editor of the standing of Sir William Crookes, O.M., F.R.S., tolerates such stuff as the leading article in two successive issues of his widely read journal, we wonder whether there is such a thing as journalistic dotage. It is not enough to overlook such incidents; the inquiries addressed to us prevent that. One must explain.

The subject of these communications is the alleged discovery of a "Chicago physiologist," Prof. Rutledge Rutherford, "a quiet and unassuming man" whose "disclosures are sure to turn everything topsy-turvy in the food world." The real food value of our nutrients, says the professor, is not centered in their content of fat, carbohydrate and protein, but in "the all-containing nutrient of foods," Trophogen. The new science of trophology, we are told, "explains why, and does not attempt to tell how; it teaches of the origin, the nature, the cause and the effect of food nutriment." Dietetics, in contrast with trophology, he asserts, is not a true science, and "a person is worse off for knowing it than for not knowing it."

A perusal of this pseudoscientific literature indicates that the writer has suddenly become aware of the significance of the accessory factors in diet — an aspect of the story of nutrition which has repeatedly been emphasized in the columns of THE JOURNAL. The findings in relation to beriberi and the subtle antineuritic substances,[2] Stepp's reports on the supposed rôle of lipoids in nutrition,[3] the important and little unraveled part played by the inorganic factors in the dietary[4] — these and other familiar novelties of experimental physiology are actually presented in March, 1913, in a publication of international repute, as the scientific discovery of a Chicago "professor." It is unnecessary to refer to the statements that preservatives destroy the life-saving principle, that it is present in plants which synthesize it and from them gets into animals, or to comment on the probable value of Trophogen, Bitrophon, or any of the astonishing discoveries thus set forth.

That the real revelations of scientific discovery are quite as wonderful as the figments of the imagination which find their way into literature in the undisguised form of fiction is too little appreciated by the story writers. The "boomfood" of H. G. Wells' "Food of the Gods" is no more marvelous in its potency than are the secretions of the ductless glands. Indeed, the marvels of fiction are little else than distorted and exaggerated applications of the actual data of science. It is interesting to study the genesis of an occasional "head liner." The announcement, a few years ago, in the newspapers throughout the world, that man is by nature a cannibal was the outcome of the publication of Michaud's studies showing that it is easier for dogs to attain nitrogenous equilibrium on a mixture of amino-acids from dog muscle than from a widely different protein. The telegraphic despatches of a month ago announcing that man's food can now be completely synthesized in the laboratory were the ingenious newspaper man's expression of Abderhalden's experiments in feeding completely digested foodstuffs.[5] Similarly a sensational editor has seized on the suggestions in Stepp's studies on mice[3] and Hopkins' researches on rats,[6] only to find in the mysterious word "lipoid" a stepping-stone by which he is "able to peer deeper into the hidden mysteries of food nutrition." Through the thin veneer of an incompetent review one sees the familiar background of well-known facts.

It is distressing to read in columns side by side with the proceedings of the Royal Society, that "fat which we have been taught to regard as one of the important nutritive principles of food, contains no particle of nutriment in itself," and that "protein was proved to possess no nutriment." We are conscious of the vein of truth in the statement in the paper in the *Chemical News* that "trophology is a true science, yet a person can enjoy just as good health and get along just as well generally without it as with it." Would it not be well for our London contemporary to follow our lead and segregate such subtle humor into a column reserved for avowed jokes?

WHAT IS GRAHAM FLOUR?

"Graham flour" is the familiar and popular name given to a milling product which is really wheat meal containing all of the grain. In manufacturing graham flour the whole of the wheat kernel, after being cleaned, is ground to a powder between stones or rollers, whose surfaces are cut so as to insure a complete crushing of the grain. It has sometimes been made by removing the outer branny portion of the kernel and grinding this separately from the inner parts, afterward mixing the two, as it was thought that the efforts to grind the naturally coarse material with the rest of the wheat had a deleterious effect on the bread-making qualities of the

1. Briggs, E. L.: The Life Nutrient in Foods, Chem. News, 1913, cvii, 133.

2. The Supposed Significance of Phosphorus Compounds in the Development of Polyneuritis and Beriberi, editorial, THE JOURNAL A. M. A., Nov. 16, 1912, p. 1801. Infantile Beriberi, editorial, THE JOURNAL A. M. A., Nov. 30, 1912, p. 1977. Antineuritic Foods, editorial, THE JOURNAL A. M. A., May 17, 1913, p. 1543.

3. The Rôle of Lipoids in Nutrition, editorial, THE JOURNAL A. M. A., Nov. 4, 1911, p. 1540; The Lipoids and Nutrition, editorial, THE JOURNAL A. M. A., March 1, 1913, p. 669.

4. Inorganic Salts and Physiologic Equilibrium, editorial, THE JOURNAL A. M. A., Aug. 17, 1912, p. 546. A New Theory of Protein Metabolism, editorial, THE JOURNAL A. M. A., Sept. 14, 1912, p. 880. Rectal Feeding and Absorption from the Large Intestine, editorial, THE JOURNAL A. M. A., Sept. 21, 1912, p. 946.

5. A Striking Experiment in Simplified Nutrition, editorial, THE JOURNAL A. M. A., May 10, 1913, p. 1464.

6. Hopkins, F. G.: Jour. Physiol., 1912, xliv, 425.

flour. Graham flour is now commonly made by crushing and grinding the whole of the kernel at once without bolting or sifting. When thus prepared it contains the same ingredients as the wheat itself and in the same proportions.

Such "unbolted wheat meal made from sound, clean, fully matured, air-dried wheat" derives its name from the American physician, Sylvester Graham. About 1839 Graham started a wide-spread agitation in favor of a return to the use of bread made from the whole of the wheat, ground but not bolted.[1] In his book, "The Science of Human Life," published in 1839, Graham emphasized the efficacy of whole-wheat flour in alimentary disorders of various sorts and urged its substitution for the superfine flour which had come into vogue. It is said that at one time, in Great Britain, owing to the fact that the newspapers and the civic physicians recommended bread made from whole-wheat flour generally, it became so universally used that in many towns it was almost impossible to find a loaf of fine-flour bread. Subsequently, owing to the heavy importation of fine flour from this country and to economic and other considerations, the people gradually returned to their old habits of eating fine-flour bread.

Graham specifically directed that the wheat to be used for bread-making should be washed and cleaned from all impurities, and should be ground by means of sharp stones, coarse rather than fine, inasmuch as he believed the coarse-ground flour to make a bread sweeter and more wholesome. Even the most successful attempts at fine grinding, however, still leave it fairly coarse and with a large proportion of branny particles. Objections to this were raised from time to time. It has been insisted, for example, that the presence of so large a proportion of the bran as there is in graham flour of this description seemed in many cases to result in irritation of the delicate mucous lining of the alimentary tract.

As a compromise between the coarse graham flour and the fine white flours (in which the bran, the aleurone layer and the germ are removed before the remainder of the kernel is ground), an intermediate product was gradually placed on the market under the name of "whole wheat" or "entire wheat" flour. These terms seem rather inexact for a product with which more or less bolting is supposed to have taken place, for they suggest something practically identical with graham flour. It has been asserted that "entire wheat" flour is prepared by removing only the woody part of the bran, leaving the aleurone layer and the germ, and that therefore it contains all the alleged nutritious part of the wheat kernel without the irritating bran. As a matter of fact, these attempts to remove only the bran do not seem always to have been entirely successful. If the intent were adequately carried out so-called entire-wheat flour would represent a grade not so coarse as graham or so fine as the white flours.

Among the many unexpected situations brought to light as the result of the enforcement of the national Food and Drugs Act is that pertaining to the manufacturing practices in connection with these coarser grades of flour. Investigations made by the government[1] disclose the fact that although many millers adhere to the original manner of preparing graham flour, a large percentage of so-called graham flours found on the market are made by mixing bran with inferior grades of flour. We are officially told that "statements made by many millers show that a very large percentage of the so-called graham flours on the market are mixed products or imitations, not made from purified middlings, bran and flour, but made from feed bran, which always contains the shorts and the germ, together with low-grade flour . . . and in many instances such alleged graham flours contain sweepings from the mill." It is further remarked that when such imitations are made by the use of high-grade flours, purified middlings and bran, it is evident that there is no desire to sell the consumer a cheap material, since the miller believes that the flour thus prepared is a better grade and that better results in baking may be obtained than with the true graham flour.

Such mixtures should obviously be branded "imitation graham flour," whatever their respective nutritive or therapeutic or technical qualities. The time has come when the protection of the consumer and the integrity of the trade call for an honest labeling of wheat products. Flour made to simulate the well-known, old-fashioned, unbolted ground whole-wheat kernel should be designated as imitation, and the term "bolted whole wheat" might appropriately be used in place of the present misnomer which designates as "entire wheat," wheat meal from which something has been removed. We may differ with one another as to the comparative virtues of whole wheat, bolted wheat, patent flour, shorts, germ meal or bran, but there should be no debate on the propriety of a representative name and an honest label.

1. Some of the facts referred to are taken from LeClerc, J. A., and Jacobs, B. R.: Graham Flour, U. S. Dept. Agric., Bureau of Chemistry, Bull. 164, Washington, Government Printing Office, 1913.

THE OFFICE OF CORONER

In an interesting article on the coroner's office, Macht[1] points out that since early times men have provided themselves with some form of legal machinery for inquiry to determine the causes and manner of deaths from unknown and unnatural causes. In most European countries to-day such investigations are directed by forensic officials who rely on medical and scientific experts in the service of the state. In order that the necessary expert work of this kind may be conducted to the best advantage, special medicolegal institutes have been established, the functions of which also include teaching and investigation. In most English-speaking

1. Macht: Johns Hopkins Hosp. Bull., 1913, xxiv, 148.

countries the duty of making the necessary inquiry into deaths from all manner of unknown and unnatural causes devolves on the coroner, who appears early in the English scheme of government.

In our states (except several in New England) the coroner is an elective county officer, and the general methods of procedure at coroner's inquests are familiar to all. When we consider the wide and important scope of the work of the coroner's office, especially in our larger cities, and how dependent he is on experts in pathology and chemistry, it is at once apparent that at present our machinery for the proper conduct of this work is quite inadequate, being for the most part in a state of cumbersome and ineffective dismemberment. As a consequence crude methods obtain, justice is hindered, money wasted, and an orderly development of medicolegal science prevented. Nothing approaching the medicolegal institutes of Germany exists in this country, and we have almost no periodical medicolegal literature.

A thorough rehabilitation of the ancient office of coroner along modern lines is urgently needed in this country. The article by Macht makes this plain. So long as the coroner remains an elective officer with a continuous tenure of at most four years it is not likely that the office will be filled generally with properly trained medical men. Until this is realized, special efforts should be made to provide adequate facilities for the proper conduct of the office. In our larger cities the work should be centralized in suitable buildings provided with well-equipped post-mortem rooms and laboratories, pathologic and toxicologic, which should be in charge of competent experts permanently attached to the coroner's staff. It is a hopeful sign that the coroner of Cook County, Illinois (Chicago), has succeeded in securing the appropriation necessary to establish a special chemical laboratory and to secure the undivided services of a capable chemist. The daily work of the coroner will be conducted more effectively and economically through better organization in these directions. But that is not all. From the more thorough and systematic study thus made possible of the many peculiar problems investigated by the coroner's staff, important additions will be made to medical knowledge, especially in the fields of pathologic anatomy and toxicology, and to sociology in general. In short, manifestly necessary improvements in the organization of the present coroner's office will increase greatly the value of its service.

DIVISION OF FEES

The vexed question of the secret division of fees, or the commission evil, is attracting more and more attention. This is encouraging, for it means that those who are guilty will stop and consider. As before remarked, there is no doubt that there are some men who divide fees, and yet we feel very sure that the evil is not so wide-spread as some suppose, or as it has been, for the discussion of the question has made many men who have not heretofore thought of it in that light realize that it is a moral wrong. Yet, while the evil has been discussed in medical journals, in societies, etc., there still seems to be a sort of general conspiracy of silence and inaction, when it comes to a definite attempt to eradicate it. This is a tacit acknowledgment that the practice is wrong; it subjects the profession to just criticism by the laity, and indeed leads the public to believe that fee-splitting is more prevalent than it really is.

The *Journal of the Indiana State Medical Association* has started an active campaign against the practice. "The very fact that the division of fees is not practiced openly, but in secret," says the *Journal*, "is sufficient to condemn it as a species of graft and dishonesty which deserves exposure and requires the adoption of means for correction of the evil. Tolerance of the practice of fee-dividing means disgrace and dishonor for the medical profession." A prominent surgeon of Indiana, having come out strongly against fee-division, invited the *Journal* to open its columns for the discussion of the question, and medical men have been asked to register openly their stand on the question. The state society as a body in a strong resolution condemns fee-splitting. The board of trustees of Indiana University, it is reported, has agreed to remove any member of the faculty of the medical department who is guilty of the practice. The *Journal* accuses the Indianapolis Medical Society of being lukewarm toward the proposition, and cites the action at a recent meeting of tabling several amendments to a resolution to incorporate in the by-laws an article providing for the automatic expulsion of any member guilty of fee-splitting. The results of the invitation of the *Journal* will be highly interesting as a declaration of the stand of the physicians of Indiana on fee-division, and should be the forerunner of a distinct improvement in the situation in that state if it is as bad as it is believed to be.

Indiana, of course, is not the only state which is attempting to eliminate the evil. The state medical association of Missouri, at its last session, defined and condemned fee-splitting. At Los Angeles, after a vigorous agitation of the subject, action was taken by the county medical society in the form of having physicians sign a pledge that they would not participate in fee-splitting. The New York Academy of Medicine passed a vigorous resolution on the subject. In Detroit the board of trustees of Harper Hospital in 1912 unanimously passed a resolution that any member of the medical staff convicted of secret division of fees should be dismissed, and adopted the definition of illegal division of fees established by the American Medical Association. More recently the faculty of the medical school of the University of Minnesota strongly denounced the secret division of fees and declared the practice tantamount to the buying and selling of patients, as disgraceful and abhorrent to every right-minded practitioner and the gravest danger that threatens the profession.

Current Comment

FEE-SPLITTING AND THE EXPLOITATION OF UNFORTUNATE GIRLS

The ramifications of the fee-splitting and commission evil are many. Two advertising circulars before us are from maternity homes for unmarried girls. Both offer substantial pay to the physician who refers the patient. In one case the expense to the girl, including adoption of the child, is from $150 to $250, and the home physician is to be given 10 per cent. of the patient's deposit. The physician has sunk pretty low who will accept money of this sort—it almost places a premium on seduction—but it illustrates the demoralizing effect of acquiescence in fee-splitting and commission-giving. Incidentally, we note that both advertisements announce that the baby will be adopted. In one state, Ohio we believe, such an announcement has been prohibited by law, on the ground of being contrary to public policy, placing an improper encouragement on baby-farming. There is room for some good legislation along this line in other states.

DR. WILEY'S ATTITUDE ON ADVERTISING

With the work of the Vigilance Committee of the Associated Advertising Clubs as his text, Dr. H. W. Wiley, writing in *Printer's Ink*, expresses in unequivocal terms his attitude toward the present advertising situation. That to exclude every fraudulent advertisement does not necessarily spell bankruptcy to publishers, he illustrates from facts in The Journal's experience. "When honest manufacturers saw that dishonest competition was cut out they hastened to get a place in a journal where no tainted advertisement was allowed. To-day The Journal of the American Medical Association has a far larger income from its advertisements than ever before." He pays tribute to the Vigilance Committee's check on turbulent elements in modern advertising, and especially to its efforts on behalf of the "model bill," now adopted in several states and under favorable consideration in others.[1] In contrast to this influence for clean advertising, Dr. Wiley mentions the attempt made by the *National Druggist*—that unfailing prop of fakery—to introduce into this model bill the word, "knowingly." Such an addition Dr. Wiley declares a device of obstructers. "There is no 'knowingly' in the law against passing counterfeit money," he continues; "when you are caught with the green goods in your hands, the law knows you know." But, the *National Druggist* protests, "the *Printer's Ink* bill would make criminal a statement that is merely [*sic*] 'untrue, deceptive, or misleading.' It does not require guilty intent or even knowledge of the act committed, to make the crime complete." Even so. Hence, let the publisher assume some moral responsibility. For "when the lying advertisement has done its perfect work and the victim is dead or bankrupt, it makes no difference to (that victim) whether the author of his effacement was malicious or only maudlin." Dr. Wiley accepts one statement, however, of the *National Druggist* as splendidly true: "It [the *Printer's Ink* bill] is likely to be placed on the statute books of many states in a short time unless some organized opposition soon develops." This acknowledgment from such a source is to Dr. Wiley but a prophecy of the final rout of fake advertisers, opposition or no opposition, and of an unconditional victory for the ethics of the Vigilance Committee of the Associated Advertising Clubs of America.

1. See The Journal A. M. A., May 3, 1913, p. 1377; May 10, 1913, p. 1482.

THEOBALD SMITH ON VACCINES

There appears in this issue of The Journal an important discussion by Theobald Smith of Boston on the present use of vaccines, both for preventive and for curative purposes.[1] We may be permitted to point out that there is no one who is entitled to receive closer attention or whose word carries more weight in discussions of general questions relating to infection and immunity than Theobald Smith. We owe to him discoveries of fundamental significance. In conjunction with Kilbourne he demonstrated that Texas or southern cattle fever is caused by a blood parasite which is transmitted through the bite of a tick, thus paving the way for the demonstrations that malaria, yellow fever and other diseases are transmitted by biting insects. He was the first to differentiate the bacillus of bovine tuberculosis from the bacillus of human tuberculosis. Smith was also the first to note the peculiar way in which a guinea-pig injected with horse-serum reacts on subsequent injection, and this phenomenon—"Theobald Smith's phenomenon"—is a central point of the recent intensive study of the various phases of anaphylaxis. This must suffice to illustrate Theobald Smith's achievements as investigator. In addition to being a great investigator he has in rare degree the power of discussion, broadly scientific and philosophic, yet eminently sane, direct and practical, of the large problems of infection and immunity. This is well shown in his instructive and clarifying consideration of preventive and curative vaccination, the diligent study of which is urged on all physicians who aim to be something higher and more useful than mere slaves of routine and unsafe commercialized short cuts.

1. Smith, Theobald: An Attempt to Interpret Present-Day Uses of Vaccines, p. 1591, this issue.

THE DUKET "CONSUMPTION CURE"

Three or four years ago we began to receive inquiries concerning a consumption cure exploited by one Peter P. Duket, M.D., in and around Findlay and Toledo, Ohio. As in all such cases, the advertising matter, circular letters, etc., sent out by the promoter were collected with the intention of making a thorough investigation. It soon became evident, however, that the fake was a minor one and that its perpetrator was but a small fish in the ocean of quackery. There were so many other and more dangerous frauds to be shown up that the Findlay concern was not deemed worth space in The Journal. The data collected were filed with such occasional additional matter as came to The Journal office; otherwise the case was forgotten. Suddenly, however, it has flared into prominence: two months ago the newspapers heralded it as a new cure for consumption

emanating from Chicago, professionally fathered by a medical college of that city and financially backed by a well-known politician and banker. The conditions under which this unknown product is now being exploited are entirely different from those under which it was pushed in Findlay; its possibilities for harm have been enormously increased through its tacit recognition by presumably responsible persons. THE JOURNAL, therefore, makes no apology for taking up the subject. We believe that when our readers have gone over the article appearing in the Propaganda Department this week, they will wonder, with us, what can have led the Bennett Medical College to lend recognition to a humbug so palpable. Mr. Lorimer's connection with this latest medical fiasco may charitably be assumed to be an altruistic one. But why men of scientific training should allow themselves to be drawn into a thing of this sort is hard to understand.

THE TRANSMISSION OF RECURRENT FEVER BY THE LOUSE

An epidemic of recurrent fever in Tunis during 1912 gave Nicolle and his co-workers the opportunity to make important investigations on the transmission of this disease, the chief results of which may be recounted. Nicolle came to this task fresh from his work on typhus fever which he, like the American investigators, found to be transmitted by the ordinary louse (*Pediculus vestimenti* as well as *P. capitis*), so that he was in full command of the best methods for studying louse transmission. Fleas, ticks and lice have all been charged with the conveyance of recurrent fever, but the evidence at hand outside of that now presented by Nicolle[1] is not sufficient to fix the charge on any one of these insects. Indeed, it has been shown that the bite of seemingly infected lice is harmless and in one experiment Nicolle, Blaizot and Conseil found that as many as 6,515 bites of infected lice were without effect on the monkey and on man. By means of the ultramicroscope the French investigators now traced the fate of the spirrillum of recurrent fever in the louse, and they found that the spirilla disappear very early and completely, to reappear after about eight days in the body cavity (*la cavité lacunaire*), where they remain about twelve days without invading any of the surrounding organs or the buccal apparatus. At the end of this time they disappear for good. These spirilla are virulent for man and for monkeys, but as they cannot escape from the insect while it is alive, infection is held to take place as a consequence of scratching and crushing the lice, whereby the spirilla are set free and may be carried on the nails to excoriations and to the conjunctiva, and thus enter the blood and cause recurrent fever. Clean-cut experiments are given, which establish this mode of transmission. As the infection may be hereditary in the louse the virus can maintain itself in this insect. These results show that the louse is the agent of transmission of recurrent fever, and this disease consequently becomes subject to the same method of prevention as exanthematic typhus. Both these diseases are louse diseases. While the investigations in question were conducted with the recurrent fever of North Africa, the results undoubtedly are applicable to the spirillosis of other countries as well; at all events it seems as if it would not be difficult to subject to experimental tests their probable transmission by lice.

1. Nicolle, Blaizot and Conseil: Étiologie de la fièvre récurrente, son mode de transmission par les poux, Ann. de l'Institut Pasteur, 1913, xvii, 204; abstract 49, p. 1670, this issue.

Medical News

CALIFORNIA

Examination for Health Director.—The Civil Service Board of Oakland announces an examination June 30 for health director, the salary being about $3,000.

Personal.—Health Commissioner L. M. Powers of Los Angeles was given a dinner by the employees of the health department May 7, at which he was presented with a diamond-studded gold shield.——It is announced that Dr. R. G. Brodrick, health officer of San Francisco, is to retire to become superintendent of the new San Francisco City and County Hospital and that his place will be filled by Dr. A. P. O'Brien, formerly health officer of the city.——The office of Dr. J. A. Copeland, Delano, was destroyed by fire, recently.

ILLINOIS

Personal.—Dr. S. M. Green, Dixon, charged with having caused the death of May Coleman, Milledgeville, by an alleged criminal operation, was found not guilty, May 11.——Dr. Z. T. Baum has just entered on his fifth term as mayor of Paris.

Appropriation Sought for State Hospital.—Dr. W. A. Crooks, the superintendent of the Watertown State Hospital, is asking for an appropriation of $165,000, of which $75,000 is for a dormitory for female patients, $25,000 for a building for male patients suffering from tuberculosis and $22,000 for the purchase of eighty additional acres of land.

Chicago

Study of Tropical Medicine.—Dr. John R. McDill, Milwaukee, who has been for several years in the Philippine Islands, has been appointed associate professor of surgery (tropical diseases) in Rush Medical College and will give a short course next winter. It is possible that this is the first step toward the establishment of a department for the study and teaching of tropical diseases in Chicago.

Hospital News.—Dr. Maximilian Meinhardt announces that he will assume personal management of the Lakeside Hospital, August 31. The hospital will thereafter be known as the Lakeshore Hospital.——The following appointments are announced on the attending staff of Cook County Hospital: department of contagious diseases, Drs. Archibald L. Hoyne, William L. Baum, George H. Weaver, Edward K. Armstrong and Anson M. Cameron; department of children's diseases, Dr. Grace L. Meigs; department of pediatrics, Drs. J. H. Hess, C. G. Grulee and Joseph Brennemann.

Honor Professor Ingals.—A number of colleagues of Dr. E. Fletcher Ingals gave a testimonial banquet April 28 in his honor and in appreciation of his forty-two years of service in the medical profession. Dr. Frank Billings presided. Addresses were made by Prof. J. G. Coulter for the University of Chicago; Hon. Frederick A. Smith for the board of trustees of the university; by Dr. E. L. Shurly, Detroit, for laryngology; by Dr. Norman Bridge, Los Angeles, for the faculty, and by Dr. Otto T. Freer, for the department of laryngology. Dr. John M. Dodson presented a loving cup to Dr. Ingals and in his response, the guest of honor gave a historical sketch of the evolution of Rush Medical College.

INDIANA

Wynn Given Loving Cup.—Dr. Frank B. Wynn, Indianapolis, was presented with a loving-cup by the officers of the Indianapolis State Medical Association, May 7.

Personal.—Dr. James H. Walker, Henryville, has been appointed consulting physician to the Indiana Reformatory, Jeffersonville.——Dr. R. O. McAlexander has been appointed president of the Board of Health of Indianapolis, vice Dr. J. H. Ford.——Dr. Henry Jameson, president of the Indianapolis Park Board, has returned from Europe.——Dr. Hugh M. Miller has succeeded Dr. C. A. Daugherty, deceased, as medical director of the Epworth Hospital, South Bend.

IOWA

New Officers.—Delaware County Medical Society at Manchester: president, Dr. M. E. Dittmer, Colesburg; secretary-treasurer, Dr. E. J. Winterberg, Delhi.——Union County Medical Society organized at Creston, May 5: president, Dr. J. W. Fry; secretary, Dr. T. V. Golden, both of Creston.

First County Hospital.—Washington County has erected the first county hospital in the state. The building was erected at a cost of $30,000 and the equipment was presented to the institution by the people of the county, and the hospital grounds embracing twelve acres, were donated by William P. Wells. The institution is located at State Center, and the number of patients for the nine months since its opening has averaged about twelve.

KENTUCKY

The New Louisville Hospital.—Dr. J. W. Fowler, superintendent of the new Louisville City Hospital, has returned from a visit to the municipal hospitals of Chicago, Toronto and Detroit and is to visit similar institutions in Boston, New York and St. Louis. It is estimated that at least $160,000 will be required for its maintenance. There will be required sixteen interns and sixty nurses. The hospital is to have a separate nurses' home which is expected to be a model of its kind.

Personal.—Dr. E. M. Ellaby, South Park, who has been seriously ill at the Norton Infirmary, Louisville, is improved and has been removed to his home.——Dr. W. C. Caywood, Winchester, has succeeded Dr. E. H. Maggard, Frankfort, as physician at the State Reformatory.——Dr. J. M. Mathews has been elected president, Drs. Joseph B. Marvin, Louisville, and J. A. Stucky, Lexington, have been made vice-presidents, and Dr. John D. Trawick, Louisville, has been elected secretary of the Kentucky Society for Social Hygiene.——Mr. Bernard Flexner, Louisville, has resigned as a member of the State Tuberculosis Commission.——Dr. Henry Enos Tuley, Louisville, was elected president of the Louisville Commercial Club, May 13.

MISSOURI

State Secretaries' Meeting.—At the annual meeting of the Society of Medical Secretaries held in Joplin, May 13, the following officers were elected: president, Dr. F. H. Matthews, Liberty; vice-presidents, Dr. A. N. Bobbitt, Joplin, and J. A. McComb, Lebanon, and secretary-treasurer, Dr. J. H. Timberman, Marston.

State Association Meeting.—At the fifty-sixth annual meeting of the Missouri State Medical Association held in St. Louis, May 15, Dr. E. H. Miller, Liberty, was elected president, Dr. E. J. Goodwin, St. Louis, secretary (reelected); Dr. J. Franklin Welch, Salisbury, treasurer (reelected); Dr. T. E. Potter, St. Joseph, orator on surgery, and Dr. T. F. Lockwood, Miller, orator on medicine.

State Board Items.—The governor has appointed the following members of the State Board of Health: Drs. F. H. Matthews, Liberty; J. A. B. Adcock, Warrensburg; R. L. Wills, Neosho; G. O. Cuppaidge, Moberly, and T. H. Wilcoxsen, Bowling Green. The new board organized, electing Dr. Matthews vice-president and Dr. Adcock secretary and state registrar of vital statistics.

St. Louis

Personal.—Dr. M. F. Harmann sailed for Europe, May 3.——Dr. Ernst Jonas has been appointed by the German government examining physician for German citizens subject to service in the Imperial army.——Dr. Harry L. Whitener who was seriously injured in an automobile accident, recently, is reported to be improving.

Cornerstones Laid.—The cornerstone for the new medical department buildings for Washington University was laid May 17. The buildings include the medical school building which is to cost $1,000,000, the Barnes Hospital which is to cost a similar amount and the Children's Hospital to cost $2,500,000.——The cornerstone of the Jewish Home for Chronic Invalids, St. Louis, was laid with appropriate ceremonies, May 4.

NEBRASKA

New Officers for State Society.—At the annual meeting of the Nebraska State Medical Association held in Omaha, May 13-15, the following officers were elected: president, Dr. D. C. Bryant, Omaha; vice-presidents, Drs. David T. Martyn, Columbus, and W. E. Shook, Shubert; secretary, Dr. Joseph M. Aiken, Omaha (reelected); treasurer, Dr. A. S. von Mansfelde, Ashland (reelected); delegate to the American Medical Association, Dr. A. R. Mitchell, Lincoln, and alternate, Dr. F. A. Long, Madison. Lincoln was selected as the meeting place for 1914.

NEW YORK

Public Health Week at Solvay.—This village has recently carried out a public health week. The State Health Department loaned the village an exhibit of charts, maps, pictures, etc., dealing with the various phases of public health, and provided lecturers.

Public Health Lectures in Parochial Schools.—With the hearty cooperation and approval of the bishops of Buffalo, Rochester, and Syracuse, the State Department of Health has arranged for special lectures to be given in the parochial schools on "Preventable Disease" and the "Carriers of Disease." To carry on this special educational work Dr. Porter has appointed Dr. Katherine Daly, Rochester, and Mrs. Elizabeth Finnegan, Lyons.

Failure to Report Births.—During 1912 there were 312 instances of failure to report births. In 300 cases the delinquents were physicians and in six midwives. In six cases excuses were accepted, while the remaining 300 were fined amounts ranging from $10 to $100. Since January there have been but 50 lapses of this nature. It is the intention of the department to prosecute to the fullest extent all present and future violations of the law. It is worthy of attention that violations of this section of the Sanitary Code seem more frequent among physicians than among midwives.

New York City

Personal.—Surgeon L. L. Williams of the United States Public Health Service has assumed the duties of chief medical officer at Ellis Island.——Dr. John R. Hicks, New Brighton, Staten Island, has been appointed chief medical officer of the hospital and detention hospital at Hoffman's Island, and Dr. Albert A. Mendez of the contagious disease station at Swinbourne Island.

War on Houseflies after City Clean-Up.—Announcement is made at the headquarters of the Health Department that as soon as the task of removing the mountains of rubbish from the streets of the city is completed the health authorities propose to eliminate as far as possible all breeding spots of flies. Especial attention will be given to vacant lots; persons who do not clean up their vacant lots will be compelled to do so and to send the refuse to the city dumps at their own expense. Notices are being sent out explaining that it will be necessary to screen all outhouses. Nearly 25,000 cards, bearing instructions to storekeepers in regard to the protection of their wares from flies, have been distributed by the members of the Housewives League and others.

OHIO

Cincinnati

Commencement Arrangements.—The annual commencement of the Medical School of the University of Cincinnati will be held June 14. Notwithstanding the recent disastrous floods, a large attendance of the alumni is expected, and arrangements are already partially completed for their entertainment. Clinics will be held each morning from 9 to 12 at the City Hospital, beginning Tuesday, June 10, and extending to Friday, June 13. Some form of entertainment is being planned by the local alumni for the visitors on Friday evening, June 13.

Modern College.—Sir William Osler has written Dr. Christian R. Holmes urging that steps be taken toward the erection of a modern medical college building near the new City Hospital to commemorate the work of Dr. Daniel Drake.——Mrs. Mary Emery has again made a generous offer for the good of Cincinnati. This time her gift consists of $125,000 to endow the pathologic department of the medical school of the university.

PENNSYLVANIA

Start Abington Hospital.—Ground has been broken for the erection of the Abington General Hospital and the work will be pushed as rapidly as possible. When completed the institution will involve an outlay of $100,000, without furnishings.

Jefferson Surgeons Hold Clinic at Harrisburg Hospital.—A clinic was held at the Harrisburg Hospital, May 16, by members of the faculty of Jefferson Medical College of Philadelphia. Those who hold the clinic were Drs. S. MacCuen Smith, H. R. Loux, H. Augustus Wilson, Thomas McCrae, E. P. Davis, J. M. Fisher and Henry K. Gaskill.

Appointments at Jefferson.—Dr. Frederick J. Kalteyer, assistant professor of medicine, associate professor of medicine; Dr. John C. DaCosta, Jr., associate professor of medicine; Dr. R. Max Goepp, assistant professor of clinical medicine; Dr. Ross V. Patterson, assistant professor of medicine, and Dr. P. Brooke Bland, assistant professor of gynecology.

Personal.—Dr. C. D. Wilkins, superintendent of the Wilkes-Barre Hospital, has been appointed superintendent of the Charity Hospital, New Orleans.——Physicians of Mahanoy City presented Dr. Phaon H. Hermany with a silver loving-cup, May 10, on the occasion of the fiftieth anniversary of his entrance into the medical profession.——Clinton County Medical Society gave a banquet May 7 in honor of Dr. R. B. Watson, Lock Haven, in celebration of his seventy-fifth birthday anniversary and his fiftieth anniversary as a practitioner.——Dr. Henry H. Riegel, Catasauqua, last week celebrated the fifty-sixth anniversary of his entrance into practice.——Dr. E. F. Bickel, Shamokin, has been chosen as secretary-treasurer of the Five County Alumni Association of the Medico-Chirurgical Faculty of Philadelphia, comprising Northumberland, Union, Snyder, Montgomery and Columbia counties.——Dr. W. N. Pringle, Johnstown, has returned from a trip to Australia and the South Sea Islands.——Drs. Walter Loftus, Carbondale, and A. L. Diefenderfer, Oringsburg, have been elected members of the medical staff of the Emergency Hospital, Scranton.——The coroner's jury on May 13 exonerated Dr. J. A. Lichty, Pittsburgh, from any blame in the death of J. A. Jackson, who was struck and killed by Dr. Lichty's automobile, March 29.——In the case of Dr. Frank H. Lawrence, Reading, who was sued for damages for alleged assault, the jury, after twenty minutes deliberation, returned a verdict in favor of the physician.

Philadelphia

War on Rats.—Dr. Joseph S. Neff, director of public health and charities, has urged householders of the city to wage unceasing war against rats, mice and roaches and has published methods for destroying these pests.

Many Vaccinated.—Vaccination of more than 3,500 persons in the northeast section of the city was made on May 11. One of the small-pox patients had attended service at the St. Paul's Church, Eighth street below Girard Avenue less than a week earlier and Dr. A. A. Cairns, chief medical inspector, demanded that the congregation be vaccinated. The church was locked and a line of police outside prevented the holding of any service until the pastor gave the assurance that every member would be vaccinated. Dr. Cairns spoke at both the morning and evening service and each person handed in his name and stated whether he wished to be vaccinated by his own or a city physician. There have been no new cases reported.

Dr. Duhring Wills $81,000 to University.—The will of Dr. Louis A. Duhring, former professor of dermatology at the University of Pennsylvania, devises approximately $81,000 to the university and hospital connected with it. The income of $25,000 is to be used for the department of cutaneous medicine. A museum for the study of cutaneous disease is to be established. Should any of the income of this $25,000 trust fund be available for other purposes, lectures, prizes and scholarships are to be awarded and facilities for research work are to be given. The University hospital is to receive $50,000 for the support of wards of free beds for the treatment of skin diseases and similar physical disorders. After the payment of other bequests the residue is to be given to the trustees of the University of Pennsylvania and to the College of Physicians to be distributed in a specified manner.

TENNESSEE

New Officers.—Chester County Medical Association reorganized at Henderson, April 26: president, Dr. J. R. Carroll, Henderson; secretary- treasurer, Dr. E. D. DeBerry, Gail.

State Board News.—Dr. E. L. Simmons, Greeneville, has been appointed a member of the State Board of Medical Examiners, vice Dr. W. H. Halbert, Nashville, resigned.——At the annual meeting of the State Board of Health in Nashville, April 29, Dr. R. E. Fort, Nashville, was elected president, Dr. A. M. Gamble, Maryville, vice-president and Dr. H. H. Shoulders, Nashville, assistant secretary of the board, was chosen as state registrar of vital statistics.

TEXAS

Free Telephone Service for Benefit of Public Health.—The people of Texas are to have at their command telephone lines of the state for health control and prevention of sickness and epidemics. Dr. Martin E. Taber, Dallas, director of the Southwestern Telegraph and Telephone Company, announces that he will appoint physicians in every city where the company maintains an exchange, and that this organization will be at the service of the community as conditions of public stress develop.

State Association Meeting.—The State Medical Association of Texas at its forty-fifth annual meeting in San Antonio, May 6-8, elected the following officers: president, Dr. Marvin L. Graves, Galveston; vice-presidents, Drs. John H. Foster, Houston, J. S. Anderson, Plainview, and R. R. White, Temple; secretary, Dr. Holman Taylor, Fort Worth (reelected); treasurer, Dr. W. L. Allison, Fort Worth; trustee, Dr. John S. Turner, Dallas; councilors: Dr. W. C. Dickey, Memphis, third district; Dr. W. A. King, San Antonio, fifth district (reelected); Dr. W. N. Wardlow, Corpus Christi, sixth district; Dr. A. C. Scott, Temple, twelfth district, and Dr. W. H. Blythe, Mount Pleasant, fifteenth district; delegates to the American Medical Association, Drs. Holman Taylor and Clay Johnson, Fort Worth, and Dr. C. A. Smith, Texarkana, and alternates, Drs. Joseph Becton, Greenville, Frank Paschal, San Antonio and O. L. Norsworthy, Houston. Houston was selected as the place of meeting for 1914.

GENERAL

French Physicians on a Visit.—Drs. Mouriquand and Leriche, professors agrégé of Lyons, France, who, as stated in THE JOURNAL of May 10, page 1473, were awarded the Falcoux and Crouzet prizes, respectively, by the Faculty of Medicine of Lyons, are visiting various points in the United States.

Medical Examiners to Meet.—The American Association of Medical Examiners will hold its annual meeting in Minneapolis, June 16, immediately preceding the meeting of the American Medical Association. Dr. Frank W. Foxworthy, Indianapolis, is president and Dr. George Strohbach, Cincinnati, Ohio, secretary-treasurer.

International Medical Congress.—It is announced from London by the committee of organization of the Seventeenth International Medical Congress, to be held there August 6-12, that the position of president of the section on ophthalmology, left vacant by the death of Sir Henry Swanzy, has been filled by the appointment of Sir Anderson Critchett. The subscription fee of $5 for the congress can be sent directly to the treasurer, 13 Hinde Street, London W., England. The wives and daughters of members can be inscribed for $2.50. Other news of the congress has appeared in THE JOURNAL from time to time and there is an item in the London Letter of this issue.

LONDON LETTER

(From Our Regular Correspondent)

LONDON, May 3, 1913.

The International Medical Congress

Some further information may be given as to the International Medical Congress which will meet in London in August. In the section of the history of medicine a wide interpretation has been given to the subject. In some cases the papers will be more or less of an anthropologic nature. A paper on the history of the relations of medicine and vivisection will be read by Mr. Stephen Paget, secretary of the Research Defense Society. That the artistic side of the subject will be well represented is shown by the following titles: "Relations between Art and the History of Medicine," Hollander; "Physiology of Vision and Impressionism in Art," Leonard Hill, and "Painting in Relation to the History of Medicine," Corsini. Sir Shirley Murphy has promised a paper on the origin and growth of public health legislation. Sir William Osler will give an illustrated lecture on the earliest printed medical books. Dr. Sambon will discuss the light thrown by the healing practices of animals and savage men on the study of primitive medicine.

In the section of psychiatry, over which Sir James Crichton Browne will preside, Janet will discuss psychanalysis; Dr. Adolf Meyer will read a paper on the psychiatric clinic, its aims, educational and therapeutic, and the results obtained in the promotion of recovery. Morselli will discuss the psychology of crime.

In the section of anatomy Dr. C. U. Ariens-Kapper of Amsterdam will read a paper on cerebral circulation and the precise function of the furrows of the brain.

In the section of physiology there will be a debate on the correlation of the organs of internal secretions and their disturbances.

In the section of pathology shock is one of the subjects to be discussed, and there is a special subsection devoted to chemical pathology.

In the section of bacteriology and immunity, among the subjects to be discussed are theories of immunity and anaphylaxis, the nature of virulence, filter passers, leprosy and allied bacteria.

In the section of therapeutics there are many novelties, such as non-bacterial toxins and antitoxins, the comparative value of heart remedies, and thermal treatment.

In the section of surgery there will be a special subsection devoted to anesthesia, general and local, and recent methods, such as spinal analgesia, and there will be a discussion of recent special methods of general anesthesia. Yandell Henderson of New Haven, Conn., will contrast the immediate and after-effects of spinal and local analgesia with inhalation anesthesia, particularly with regard to shock. Postoperative shock will also come under review.

In the section of ophthalmology Carl von Hess of Würzburg will read a paper on "Affections of the Eye Produced by Undue Exposure to Light."

In the section of hygiene and preventive medicine, the following subjects will be discussed: the effect of dust in producing diseases of the lungs, infant mortality in the first weeks of life, the factors that determine the rise, spread and severity of epidemic diseases, the supervision of the health of children between infancy and school age, and the causes, prevention and treatment of visual defects in school children.

In the section of naval and military medicine, the subjects are: hospital ships and transport of wounded, transport of wounded in hill warfare, water-supplies in the field, antityphoid inoculation, sanitary organization in the tropics, caisson disease and the physiology of physical training and marching. In the section of tropical medicine and hygiene the subjects to be discussed are plague, beriberi, leishmaniasis and relapsing fevers.

International Dental Congress

The sixth International Dental Congress will be held in London, August 3-8, 1914, at the invitation of the British Dental Association. The meetings will be held at the University of London and the Imperial College of Science and Technology, South Kensington. The president will be Mr. J. Howard Mummery. Previous congresses have taken place in Paris, 1889; Chicago, 1893; Paris, 1900; St. Louis, 1904, and on the last occasion at Berlin, in the Reichstag, in 1909, when the German emperor took a personal interest in the meeting. Delegates attended from twenty different countries, and the governments of many of them were officially represented. Invitations are being issued to dental organizations throughout the world, and it is hoped thus to secure the cooperation of leading specialists and representative authorities in all branches of dental surgery. The rules of the International Dental Congress provide that all ethical practitioners of dentistry possessing the qualifications of the country in which they received their professional education, or of the country in which they practice, are eligible for membership. The subscription for members of the congress will be $7.50, and for members of their families accompanying them, $3.75. The offices of the congress are at 19 Hanover Square, London, W., to which address all communications should be sent.

PARIS LETTER

(From Our Regular Correspondent)

PARIS, May 2, 1912.

Death of Sigismond Jaccoud

Dr. Jaccoud, who was life secretary of the Académie de médecine, and formerly professor of clinical medicine at the Faculté de médecine de Paris, is dead at the age of 83. Although somewhat in the background during his last years, Jaccoud formerly held an important place in the medical profession.

Jaccoud was born at Geneva, Nov. 29, 1830. He earned the money to pay for his medical education by playing as one of the first violinists at the Opéra-Comique. He was given his medical degree in 1860, and his thesis had for its subject the pathogenic conditions of albuminuria. In 1862 he was given the position of physician to the hospitals of Paris, was *agrégé* in 1863, and professor in 1876. At first he taught internal pathology, and later became professor of clinical medicine. In 1877 he was elected to the Académie de médecine, and occupied the position of life secretary since 1901.

Although as a consulting physician, perhaps from his somewhat reserved personality, he never reached the prominence held, for example, by one of his pupils, Dieulafoy, he won great renown by his works. He was versed in several languages and was noted for his erudition. His "Traité de pathologie interne," the first edition of which was published in 1871, was long a favorite with students. He was the author of several volumes of "Leçons cliniques," and under his direction there were published, from 1864 to 1886, the "Nouveau dictionnaire de médecine et de chirurgie pratiques," in forty volumes. This work is yet known, for short, as Jaccoud's Dictionary.

The Spirochete in the Brain in General Paralysis

In several recent articles Noguchi and Moore have shown that the *Spirochaeta pallida* can be found in the brain in cases of general paralysis with the silver method of Levaditi (as mentioned in abstract, THE JOURNAL, Feb. 22, 1913, p. 627). These organisms are found distributed through the gray substance of the convolutions, and are not related to the meninges or the lesions. The spirochetes are found not in all brains examined in cases of typical general paralysis, but in from 17 to 24 per cent. This finding, so important from the point of view of etiology and perhaps even of therapy, has been confirmed recently by Marinesco and Minea, who found the spirochete in one case among twenty-six examined for this purpose, by the silver method. Dr. A. Marie, chief physician of the public asylums of the Seine, reported at a recent meeting of the Société de biologie that in collaboration with Drs. C. Levaditi and J. Bankowski, he had been able to find spirochetes in the cerebral cortex in two cases of true paralysis out of twenty-four examined for this purpose. One of the patients had had general paralysis for seven years, with false remissions. It is interesting to learn that the pathogenic agent of syphilis can remain in the brain notwithstanding the long duration of general paralysis. In the second case the duration of the disease was short. Recently Marie has discovered the spirochete in the brain of a patient with general paralysis, not only with the ultramicroscope, the method used by Noguchi, but also by the India-ink method used by Burri and the method of Fontana-Tribondeau.

BERLIN LETTER

(From Our Regular Correspondent)

BERLIN, April 18, 1913.

Sixth International Congress on Physiotherapy

(Continued from page 1554)

RADIUM EMANATIONS IN THERAPEUTICS

Ramsauer reported on a method of administration from which the chief defects have been eliminated and the exactness of which has been determined by a quantitative estimation of the possible experimental errors. Particularly the freedom from error with this technic in the activation in the emanatorium and thermostat and in drawing blood, and the completeness of inactivation and the sufficient accuracy of the methods of estimation have been determined.

Holthusen reported on the absolute value of the absorption coefficients found under the greatest variation of experimental conditions. The results varied in the normal blood between 0.295 and 0.325 with complete independence of a partial pressure. The extremes in anemia and polycythemia were 0.22 and 0.37. The content in red blood-corpuscles was shown to be a determining factor for the height of the absorption coefficients.

Kisch of Marienbad uttered a warning against the overestimation of radio-activity as the potent factor in mineral springs. There is no reason to displace the well-known chemical and physical qualities of mineral springs by their radio-activity, or to hold that the degree of radio-activity of the springs runs parallel with their value. Ordinary spring water often contains more radio-active units than the well-known curative springs. Only a slight amount of emanation is shown by the well-recognized active saline waters, and also the sulphate waters so highly valued in balneotherapy. The radio-active springs are suited neither for drinking nor for the bath treatment, as an insufficient number of units is communicated to the organism in this way. Even the emanatoriums—artificial mineral springs—do not furnish sufficient units. Every mineral spring is an individuality the peculiar value of which is to be estimated not by this or that constituent, but according to the manner in which they are combined and its physical and chemical properties.

Kionka of Jena reported on the pharmacologic action of radium emanations. He showed by lantern slides the favor-

ing influence of radium emanations on the growth of the green parts of plants and their inhibitory influence on the growth of roots. Further he showed lantern-slides of photomicrographs of pieces of elder pith which had been inserted under the skin of frogs kept in water containing emanations. In these there was shown restriction of the immigration of leukocytes. Exactly the same phenomena were observed on frogs which were kept in very dilute barium solutions.

RELATION OF IMMUNITY TO NUTRITION

Czerny of Berlin spoke on the dependence of natural immunity on nutrition. He recognizes the maintenance of the natural immunity as a function of the living organism. Children born at term, who were nourished with mother's milk, show in the majority of cases so high a degree of immunity that their growth is not disturbed by infections. Natural immunity is very closely allied to nutrition. An infection of the mouth with thrush is not possible in a normally born and breast-fed child, but as soon as a slight disturbance of the nutrition occurs the child loses the natural immunity. The bottle-fed child is at a great disadvantage as compared with the breast-fed child. One-sided nutrition with carbohydrates injures the immunity of children, and therefore fat in the form of cod-liver oil should be added to the nutriment.

Weigert found that tuberculous children who were nourished with carbohydrates succumbed more easily than when they were nourished with fat. The water content of the organism is inversely proportioned to the natural immunity. Carbohydrate diet increases unnecessarily the amount of water and prompts a rapid rise in the body-weight, but such children are water-logged and show slight resisting power against infection. The lack of absorbable calcium salts in the diet favors the water-logging. The exudative diathesis is most readily removed if after the first year of life as little milk as possible enters into the diet.

ALCOHOL IN INFECTIOUS DISEASES

Ewald of Berlin spoke on the subject of alcohol and infectious diseases. The opinion has now been reached that alcohol no longer plays the rôle in therapeutics, especially of infectious diseases, that was formerly ascribed to it. The injury caused by the alcohol to the infection does not compensate for the harm resulting from the unfavorable influences on the natural protective power of the organism, the blood-pressure and the respiration. The stimulating action of alcohol on the heart is of only short duration and is followed by a marked decline. It was believed formerly that treatment by alcohol was especially indicated in the infectious tropical diseases, in syphilis and other venereal diseases, in pneumonia, rheumatism, scarlet fever, measles and diphtheria. But at present the opinion prevails that treatment with alcohol is injurious rather than advantageous in many cases. Even in pulmonary tuberculosis the injurious influence of alcohol is established. Ewald gives alcohol only in severe heart-failure and in certain forms of diabetes, particularly in incurable cases, in order to divert the mind of the patient from dwelling on the hopelessness of his condition.

DIET IN CHOLELITHIASIS

Salomon of Vienna discussed the dietetic treatment of patients with gall-stones. In the latent stage of cholelithiasis a diet should be maintained which is appropriate in cases of hyperacidity; especially all fats of minor value should be avoided, as well as irritating spices, coarse varieties of the cabbage family, uncooked vegetables and particularly fat foods, mayonnaise, coffee, alcohol, cold drinks, etc. The habitual use of cathartics should be discouraged; on the other hand, saline mineral waters have a very good effect. A well-regulated intestinal peristalsis seems to be the best stimulus for the flow of bile. The treatment of constipation often causes the disappearance of severe pain and febrile attacks. This may explain the success of a course of eating grapes.

DIET IN DIABETES

Von Noorden of Vienna discussed the dietetic treatment of severe diabetes with special reference to acidosis. He distinguishes benign forms of severe glycosuria and a malignant form in which the patients often feel best when they receive from 75 to 120 gm. of bread daily with the inclusion of short periods of vegetable days, oatmeal days and single abstinence days, and in which the diet must be the more liberal the more hopeless the case is. In the benign forms the most careful estimation of tolerance should be made, not only with reference to the amount of carbohydrate which can be taken within twenty-four hours, but also with reference to the question of whether the same amount should be taken at one time or in small portions, and whether it is better to give it in the morning or evening. All other factors should also be carefully considered. Oatmeal days are especially suitable, also the vegetable and egg days or abstinence days. In other cases of glycosuria, freedom from sugar can be obtained only temporarily. For these one should use a strict diet only in case no marked acetonuria occurs. In such a case one should administer carbohydrates in order to avert immediate danger. The best service is given by a varied diet; finally, in same cases the ocurrence of threatening coma may be postponed by the oatmeal diet. Alcohol is a valuable aid in nutrition in most cases of severe diabetes, as it facilitates the giving of fats and furnishes a large amount of energy. In threatening coma the administration of cognac or whisky is to be recommended.

Marriages

DAVID C. DODDS, M.D., Summerfield, Kan., to Miss Hulda Wolking, formerly of Clay County, Kan., at Albuquerque, New Mex., April 30.

ROBERT B. MIDDLEBROOK, M.D., Wessington, S. Dak., to Miss Julia McPherson Ward of Kansas City, Mo., April 11.

EDWARD R. SCHUNK, M.D., Dietz, Wyo., to Miss Elva C. Bradley of Plano, Ill., in Sheridan, Wyo., April 30.

DEWEY SUTTON, M.D., Wolsey, S. Dak., to Miss Grace Corley of Huron, S. Dak., at Mellette, S. Dak., April 30.

WILLIAM CHARLES TROXELL, M.D., Allentown, Pa., to Miss Lillian F. Schuler of East Texas, Pa., May 8.

JOHN FRANK STANDEVEN, M.D., Wall, S. Dak., to Miss Mary Elsie Wylie of Randolph, Iowa, April 30.

JOSEPH SAMUEL COHEN, M.D., Philadelphia, to Miss Dorothy Shaffer of Allentown, Pa., May 6.

MORRIS BENJAMIN BADT, M.D., to Miss Mabel Glenn, both of Fort Worth, Tex., May 8.

OSCAR E. VEATCH, M.D., to Miss Helen Johnson, both of Fort Worth, Tex., April 30.

Deaths

Ernest L. Shurly, M.D. University of Buffalo, N. Y., 1863; a member of the American Medical Association and American Laryngological Association; one of the founders and emeritus professor of laryngology and clinical medicine in the Detroit College of Medicine; formerly acting assistant surgeon in the Army with service in Indian campaigns and the Yellowstone Expedition; a pioneer in the fight against tuberculosis; founder of the first tuberculosis camp in Michigan at Eloise; a specialist in diseases of the nose, throat and chest and author of standard works in this specialty; for many years chief of staff of the Harper Hospital, Detroit, and a member of the staff of St. Mary's, St. Luke's and the Woman's hospitals; died in Harper Hospital, May 10, from heart disease, aged 67.

Arthur Edward Spohn, M.D. Long Island College Hospital, Brooklyn, 1867; Bellevue Hospital Medical College, 1879; professor of surgical anatomy in Long Island College Hospital in 1867-1868; for more than forty years a practitioner of Corpus Christi, Tex.; formerly assistant surgeon U. S. M. H. Service; an expert in yellow fever; died at his home in Corpus Christi, May 6, from cerebral hemorrhage. In respect to Dr. Spohn's memory, all business houses and public schools of the city were closed during the time of the funeral.

George Herman Powers, M.D. Harvard Medical School, 1865; a member of the American Medical Association; emeritus professor of ophthalmology in the University of California, San Francisco; oculist and aurist for the Southern Pacific System, St. Luke's, St. Mary's and San Francisco City and County hospitals; one of the first specialists in diseases of the eye and ear of San Francisco; a surgeon of volunteers during the Civil War; died at the home of his daughter in Detroit, May 4, from heart disease, aged 72.

Edmund A. Reilly, M.D. Western Reserve University, Cleveland, 1881; a member of the Medical Society of the State of New York and American Public Health Association; health

officer of Elmira from 1889 to 1894; died at his home after a long illness, April 29, aged 53. At a joint meeting of the Medical Society of the County of Chemung and the Elmira Academy of Medicine, May 2, eulogistic addresses were made and a committee was appointed to prepare suitable resolutions regarding the death of Dr. Reilly.

Alexander Gray Fell, M.D. University of Pennsylvania, Philadelphia, 1887; a member of the American Medical Association and president of the Luzerne County Medical Society in 1901; a school director of Wilkes-Barre and one of the most prominent practitioners of the Wyoming Valley; one of the staff surgeons of the Nesbitt West Side Hospital and Wilkes-Barre City Hospital; died at his home, May 1, from heart disease, aged 52.

George Hancock Ingalls, M.D. University of Vermont, Burlington, 1885; formerly a member of the American Medical Association; a member of the Massachusetts Medical Society and a councilor of the Roxbury District Medical Society; formerly a practitioner of Jamaica Plain, Boston; a member of the New Hampshire legislature in 1893 and 1894; died at his home in East Kingston, N. H., about May 5, aged 52.

Louis George Le Beuf, M.D. Tulane University, New Orleans, 1887; formerly a member of the American Medical Association and once president of the Orleans Parish Medical Society; one of the first to institute a campaign of education that yellow fever was contagious only through the mosquito; for several years coroner of Jefferson Parish; died at his home in Pass Christian, Miss., May 5, aged 47.

Albert G. Pickett, M.D. Medical College of Ohio, Cincinnati, 1847; Illinois Army Board, 1862; assistant surgeon of the Fiftieth Illinois Volunteer Infantry during the Civil War; thereafter a practitioner of Mattoon, Ill., until 1898, when he moved to Chicago; died at the home of his daughter in Urbana, Ill., May 5, from myocarditis, aged 86.

William Kirk Jameson, M.D. University of Michigan, Ann Arbor, 1866; a veteran of the Civil War, in which he served as surgeon of the Thirtieth Wisconsin Volunteer Infantry; for many years a practitioner of Muscoda, Wis.; died at the home of his daughter in Moscow, Idaho, March 24, from hemorrhage of the stomach, aged 77.

Michael Edward McGann, M.D. College of Physicians and Surgeons, Chicago, 1903; a member of the Illinois State Medical Society and a veteran of the Spanish-American War; a member of the executive board of St. Joseph's Hospital, Joliet, for the past five years; died at his home, May 7, from disease of the intestine, aged 38.

David Coggin, M.D. Harvard Medical School, 1868; a member of the American Ophthalmological Association and Massachusetts Medical Society; a specialist on diseases of the eye and ear, of Salem, Mass.; for many years in charge of the eye and ear department of the Salem Hospital; died at his home, May 7, aged 70.

James K. White, M.D. University of Louisville, Ky., 1877; a member of the American Medical Association; a member of the staff of the Beaver Valley General Hospital; for one term coroner of Beaver County; a member of the New Brighton School Board; died at his home in that place, May 4, aged 63.

Benjamin H. Barr, M.D. Homeopathic Medical College of Pennsylvania, Philadelphia, 1855; surgeon-in-chief of an army corps during the Civil War; for many years a practitioner of Philadelphia; died at the home of his daughter in Burlington, N. J., May 5, from senile debility, aged 85.

Charles Dickinson, M.D. Albany (N. Y.) Medical College, 1860; once president of the Scoharie County (N. Y.) Medical Society; for many years a practitioner of Seward; died at the home of his daughter in Cobleskill, N. Y., April 29, from cerebral hemorrhage, aged 79.

George W. McElveen, M.D. Baltimore University School of Medicine, 1885; a veteran of the Spanish-American War, in which he served in the hospital corps of the Thirty-Fourth Michigan Infantry, U. S. V.; died at his home in Detroit, May 11, aged 46.

Edmond Arthur Waggener, M.D. University of Louisville, Ky., 1871; Bellevue Hospital Medical College, 1873; a member of the Kentucky State Medical Association and a Confederate veteran; died at his home in Columbia, May 5, aged 67.

Carl Faber, M.D. Chicago Homeopathic Medical College, 1879; formerly of Blue Island and Monee, Ill.; a veteran of the Franco-German and Spanish-American wars; died at his home in Steger, Ill., April 26, from arteriosclerosis.

George R. Sanborn, M.D. Berkshire Medical College, Pittsfield, Mass., 1850; for more than half a century a practitioner of New Haven, Conn.; died at his home in Middlebury, Vt., April 22, from senile debility, aged 86.

William Luther Shollenbarger, M.D. Medical College of Ohio, Cincinnati, 1899; of Winton Place, Cincinnati; a member of the American Medical Association; died at the Bethesda Hospital, Cincinnati, May 5, aged 39.

George Washington Peddy, M.D. New Orleans School of Medicine, 1859; surgeon of the Fifty-Sixth Georgia Regiment, C. S. A., during the Civil War; died at his home in Newnan, Ga., May 6, from erysipelas, aged 75.

Charles W. McIntyre, M.D. University of Louisville, Ky., 1887; died in his office in Louisville, March 26, from the effects of carbolic acid, believed to have been self-administered with suicidal intent, aged 43.

Edward Russell Ogden, M.D. Northwestern University, Chicago, 1884; a member of the American Medical Association and Physicians' Club of Chicago; died at his home in Chicago, May 14, from pneumonia, aged 50.

J. D. Bradley, M.D. St. Louis College of Physicians and Surgeons, 1893; a pioneer practitioner of Sebastian County, Ark.; died in the Sparks Memorial Hospital, Fort Smith, April 30, from nephritis, aged 64.

James Samuel Tazewell Baird, M.D. Jefferson Medical College, 1852; for many years a practitioner in and around Asheville, N. C., died at his home in Beaverdam, N. C., April 22, from senile debility, aged 81.

Jeremiah Beattie, M.D. Cincinnati College of Medicine and Surgery, 1875; for thirty-eight years a practitioner of Salt Lake City; died suddenly at his home, May 7, from heart disease, aged 74.

William Ray Inghram, M.D. Hahnemann Medical College, Philadelphia, 1906; who went to Arizona a year later on account of his health; died at his home in Tucson, May 6, aged 35.

George M. Goodrich, M.D. Eclectic Medical Institute, Cincinnati, 1883; a member of the State Medical Society of Wisconsin; died at his home in Clintonville, May 5, from diabetes, aged 52.

John Mahon MacDonald, M.D. New York University, New York City, 1890; of Belleville, N. J.; died at the home of his brother in Red Bank, N. J., March 29, from heart disease, aged 45.

Thomas Nelson Watson Morris, M.D. University of Virginia, Charlottesville, 1881; of Poindexter; died at the home of his brother Hazelbrook, in Trevilians, Va., about April 28, aged 53.

Abel S. Cloud, M.D. University of Louisville, Ky., 1868; of Kiowa; a member of the Kansas Medical Society; died at the home of his son in Cherokee, Kan., about May 2.

Putnam Brinley, M.D. University of Pennsylvania, Philadelphia, 1851; of Hartford, Conn.; died in the Hartford Retreat, April 30, from senile debility, aged 87.

Evans M. Myers, M.D. University of Maryland, Baltimore, 1901; a member of the American Medical Association; died at his home in Bennet, Neb., April 29, aged 37.

C. D. Crawford, M.D. Washington University, St. Louis, 1868; formerly of Malden, Mo.; died at the home of his daughter in Pine Bluff, Ark., April 24, aged 77.

John Haven Emerson, M.D. College of Physicians and Surgeons, New York City, 1865; died at his home in New York City, May 4, from cerebral hemorrhage, aged 73.

John Theron James, M.D. University of Buffalo, N. Y., 1889; a life-long resident of Medina, N. Y.; died in the Rochester (N. Y.) General Hospital, May 4, aged 52.

Charles W. Slocum, M.D. Eclectic Medical Institute, Cincinnati, 1855; died at his home in Morenci, Mich., April 24, from cerebral hemorrhage, aged 80.

R. Durant Morford, M.D. Western Reserve University, Cleveland, 1882; of McKeesport, Pa.; died in the McKeesport Hospital, May 7, aged 58.

Frank Taylor, M.D. Saginaw Valley (Mich.) Medical College, 1900; died at his home in Spokane, Wash., May 1, aged 44.

William Henry Meredith, M.D. Jefferson Medical College, 1866; died at his home in Quakertown, Pa., about May 1, aged 69.

Robert Watts Eastman, M.D. University of Buffalo, N. Y., 1879; died at his home in New York City, May 5, aged 60.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

THE DUKET CONSUMPTION "CURE"

Giving the Results of Some Investigations

Two weeks ago we gave a brief outline of a so-called cure for consumption exploited by one Peter P. Duket, M.D., and now being financed by ex-Senator William Lorimer. The reply of Duket and his backers in the newspapers to the criticisms is that THE JOURNAL is making a personal "attack" and that no matter what Duket's personal shortcomings may be, the essential point is, does he produce "cures"? THE JOURNAL has made no "attack" on Duket personally; in fact, every effort has been made to avoid personalities.

To recapitulate briefly: In 1910, Duket was operating a "sanitarium" at Findlay, Ohio, where he exploited what he termed an "antiseptic lymph" for the cure of tuberculosis. At that time he claimed to produce cures in 90 per cent. of all cases in the "first stage" of consumption, in 75 per cent. of cases in the "second stage" and in 50 per cent. of those in the "third stage." Before that time he was advertising in the Toledo newspapers his "combination of vitalized and electrified air" as a "godsend to the sick"—"two trial treatments free."

THE CURE ESPOUSED BY A MEDICAL COLLEGE

The object of the present article is to show what Duket really accomplished with his "cure" when in Findlay. Before taking this up in detail, the following facts should be given our readers: The only reason that Duket and his cure are now being given any serious consideration is that recently the Bennett Medical College of Chicago has assumed to act as his professional sponsor while ex-Senator Lorimer is backing him financially. Duket seems to have approached the medical college at the psychologic moment. It was at a time when the newspapers were full of the Friedmann "cure"; when descriptions of serums for tuberculosis made splendid copy for newspaper "stories"; when the public imagination was fired with the therapeutic possibilities of secret—and therefore awe-inspiring—remedies. Bennett Medical College, then —whether from altruistic or ulterior motives, we are not prepared to say—seems to have decided to father the Duket "lymph," or, as the newspapers have it, "serum"; but capital was necessary—and straightway forthcoming from Mr. Lorimer. Whether Mr. Lorimer's interest in the Duket "cure" was prompted by a desire to get before the public in a more favorable light than that which he achieved in his political ventures, or whether it was a sincere desire to give humanity the benefit of some of his abundant wealth, need not be discussed. Motives in such a case are unessential. The facts are: a man of little education, of no scientific standing and of quackish tendencies has been given a certain professional recognition by the sponsorship of a medical college, and a financial standing by the aid of ex-Senator Lorimer.

WHAT HAS IT ACCOMPLISHED?

Duket claims to have "discovered" his "serum" or "lymph" nine years ago. What has he to show for it? So far as we have been able to discover, the main exhibit is a long list of death certificates. When conducting his "Tubercular Sanitarium" at Findlay, Ohio, Duket issued a prospectus containing a description of the "sanitarium" and a farrago of pseudoscientific nonsense about the "cure." The booklet also gave what purported to be reports of cases of tuberculosis in patients who were successfully treated by his "exclusive" method. Of the fifteen case-reports, in only three were actual names furnished. The remaining twelve were identified by initials and addresses. Of these twelve, four were Toledo patients, and it is manifestly impossible to obtain data regarding individuals who are known only by initials and who live, or did live, in a city of nearly 200,000 population. This left eight cases of patients, identifiable only by initials, and living in small towns, whom Duket claimed to have cured with his "lymph." Inquiries were addressed to physicians in these towns asking for such information as they could give us regarding the cases. We have received replies from four of them.

Here it should be said that the three cases described in Duket's booklet in which the full names and addresses were given are those of Henry Buske of Toledo, Herman Buske of Adrian, Mich., and Bessie Gartz of Toledo. The two Buskes are brothers and are both living; Miss Gartz, also, is living. These three seem to be Duket's forlorn hope in his present exploitation. Miss Gartz admits that she and the two Buskes were present at a consultation held in Adrian, Mich., a little while ago at which a representative of the Bennett Medical College was among those present. In the reports that follow, it should be noted that Henry Buske seems to have drummed up a good deal of "trade" for Duket at the time he was in Findlay.

PUBLISHED REPORTS—AND THE FACTS

Now for the reports on those cases, that we have been able to trace, described in the Duket booklet published in March, 1911.

What the booklet said: "Mrs. B. McC. ————, Circleville, Ohio. Admitted on Sept. 24, 1910. Weight 90 pounds. The disease had reached the stage of suppuration, or third stage. Left on Dec. 3, 1910. Weight 97 pounds. Feeling good."

What we found: Mrs. B. McC——, Circleville, Ohio, although reported to have left Duket's "sanitarium" in December, 1910, "feeling good," went back there in March, 1911. Her daughter states that she "never was any better any time while under this treatment." She died July, 1911, of pulmonary tuberculosis.

What the booklet said: "Mrs. F. McG. ————, Upper Sandusky, Ohio. Admitted on Oct. 26, 1910. Weight 95½ pounds. Left on Jan. 14, 1911. Weight 105½ pounds. The disease had reached the third stage and well advanced. The patient is now in good health."

What we found: Mrs. F. McG——— went to a reputable physician in Upper Sandusky a few weeks after her return—"in good health"—from Duket's "sanitarium." The physician reports that he "found her in very advanced pulmonary tuberculosis with some involvement of the digestive tract." This diagnosis was substantiated by a bacteriologic examination made at the Hygienic Laboratories of the Ohio State Board of Health. Mrs. McG——— then went to another physician, who advised an operation, to which she submitted. She died a few days after the operation. The physician who first examined her after her return from the Duket place says: "I am satisfied she would have died of tuberculosis in three months at most from the time I first saw her."

What the booklet said: "Mrs. C. L. ————, Arlington, Ohio. Admitted on Nov. 12, 1910. Weight 94½ pounds. Left on Jan. 1911. Weight 120½ pounds. The disease had reached the third stage. The patient is now feeling well."

What we found: Mrs. C. L——— was not benefited by the Duket treatment. Our informant writes: "The lady was up and able to do part of her work *before* treatment, which she was never able to *thereafter*." Mrs. L——— died of tuberculosis in July, 1912.

What the booklet said: "Mrs. C. F. K. ————, McComb, Ohio. Admitted on Nov. 12, 1910. Weight 94½ pounds. Left on Jan. 22, 1911. Weight 108 pounds. The disease had reached the third stage. The patient is now feeling well."

What we found: Mrs. C. F. K——— died of pulmonary tuberculosis in April, 1911, three months after leaving the Duket place, "feeling well."

SOME MORE "CURES"

These are all the reports we have obtained up to date regarding the cases described in the Duket booklet. We have

however, been able to obtain reports of other cases of which Duket—with more shrewdness than frankness—makes no record in his booklet. We have signed statements for the matter we are about to give and also have certified copies of the death certificates of the individuals whose cases are described. To shield the relatives of the unfortunate victims from an unenviable publicity, we give merely the initials of the persons involved:

Mr. S. C———. First taken sick in 1911. Went to Findlay in the fall, where he took three treatments, staying about two months. Duket said to have promised to cure him in three treatments, but the patient returned unimproved. Died July, 1912.

Mr. A. K———'s mother states that her son first went to the Ohio state sanatorium for tuberculosis, where he remained under treatment until June, 1910. Came home much improved. Later he went to Duket's "sanitarium," where he received three injections. The "treatment" cost $210. Duket is claimed to have said that three treatments would cure him. After giving the treatments Duket is said to have told the patient he was cured and could go home. He died January, 1913.

Mr. F. J. K———'s mother states that her son first heard of Duket in January, 1911, from an acquaintance of Henry Buske. Duket and Buske called to see him and Duket is said to have promised a cure after three treatments. Treatments cost $195. Had the last treatment in March, 1911; died two weeks later.

Mr. W. B———'s wife said that her husband heard of Duket through a man who worked with Henry Buske. Went to Duket's "sanitarium" in June, 1910, and stayed six weeks. Received four or five injections. Returned home weaker than before going away. Died November, 1910.

Mr. G. C. S———'s father stated that his son was persuaded to go to Findlay by the man who was financing Duket's "sanitarium." Was told that if he would take three injections three weeks apart he would be able to return home cured. Was to pay $25 for each treatment and $15 a week for board. Went to the Duket "sanitarium" in July, 1910. Was given four injections. Death occurred in September, 1910. Duket is said to have collected for the fourth treatment after threatening suit.

Miss W. W———, according to her mother, heard of the Duket treatment through a relative of Henry Buske. Buske sent Duket to call. Duket is said to have claimed he could cure Miss W——— in four treatments. She went to Findlay in January, 1911, and had three treatments, paid $25 for each treatment and $15 a week in advance for room. After six weeks Duket advised her to return home, which she did in March, 1911. Four weeks later she died. Her mother states that her daughter "had not coughed or raised sputum" until after beginning the Duket treatment.

Miss M. S. C———, who is still living, states that she heard of Duket through Henry Buske and that Duket promised the first treatment would relieve her cough and that two more treatments would make a definite cure. Duket wanted to give a fourth treatment but she would not permit it. When giving the second treatment, Duket failed to locate a vein and had to make two incisions. Miss C——— has four large scars as a result of the "treatment." She states that she never had any hemorrhages, that the treatment did not modify the cough and that she lost weight while at the "sanitarium." She also states that Duket had only one nurse at any one time at the "sanitarium" and that this nurse also had to do the cooking. When Miss C——— refused the fourth treatment, Duket told her she would not live three months. This was three years ago. Miss C——— is still living.

Such, then, are the records of some of the Duket cases of which we have learned. To give in brief the results of our investigations, the following list is printed. Unquestionably it could be greatly enlarged if a more extended search were made but, as it is, it should be sufficient to demonstrate the absolute worthlessness of the "cure" and the utter unreliability of the man exploiting it. These cases are not selected.

PATIENT	ADDRESS	CONDITION
1. Miss M. S. C.	Toledo, Ohio	Alive
2. Mr. S. C.	Toledo, Ohio	Dead
3. Mr. A. K.	Toledo, Ohio	Dead
4. Mr. F. K. K.	Toledo, Ohio	Dead
5. Mr. W. L.	Toledo, Ohio	Dead
6. Mr. G. C. S.	Toledo, Ohio	Dead
7. Miss W. W.	Toledo, Ohio	Dead
8. Miss B. G.	Toledo, Ohio	Alive
9. Mrs. E. O'H.	Findlay, Ohio	Dead
10. Mrs. A. M. E.	Lucas County, Ohio	Dead
11. Mrs. S. E. U.	Toledo, Ohio	Dead
12. Mr. O. B.	Toledo, Ohio	Dead
13. Mr. H. B.	Toledo, Ohio	Alive
14. Mr. H. B.	Adrian, Mich.	Alive
15. Mrs. B. McC.	Circleville, Ohio	Dead
16. Mrs. F. McG.	Upper Sandusky, Ohio	Dead
17. Mrs. C. L.	Arlington, Ohio	Dead
18. Mrs. C. F. K.	McComb, Ohio	Dead

A SECRET "CURE"

What is the Duket "cure"? We do not know. The medical profession does not know. Secrecy is quackery's handmaid. To the public there is something mysterious in a medical treatment put forward under exaggerated claims and whose composition no one but the exploiter knows.

In investigating the Duket cure, the JOURNAL'S representative was told that while operating the Findlay concern, Duket bought his drugs from Niles, Mich., and that it was thought that he was using a widely advertised "consumption cure" known as the Hyer-Baldwin preparation. While this product does not seem to have a fixed composition, it has been claimed to consist of:

Guaiacol carbonate	12.5 per cent.
Salicylic acid	37.5 per cent.
Glycerin	50 per cent.

This mixture, according to its exploiters, is to be injected intravenously. Whether Duket's "cure" is the same as the Hyer-Baldwin "cure," we do not know, but there is a striking similarity in the claims made for, and the method of exploiting, the two preparations.

GOVERNMENT AID FOR QUACKERY

One more point must be referred to before closing. As we said in the previous article, the United States Public Health Service has been called on to make an investigation of Duket's "cure." Through whose influence this was accomplished we do not know, although the newspapers of the country ascribe it to Mr. Lorimer. It is an outrageous state of affairs when the machinery of a scientific department of the United States government can be set in motion for no other purpose than that of advertising a secret nostrum exploited by a man of no scientific standing and of unsavory professional reputation. Duket's cure has no more claim to serious consideration on the part of the United States Public Health Service than has Yonkerman's Tuberculozyne, Hill's Consumption Cure, Tuberclecide, Nature's Creation, Lung Germine, Oxidaze, Eckman's Alterative or any other of the scores of "consumption cures" with which the country is flooded. This much is certain: If the report of the Public Health Service is an unfavorable one, then it should not only be given the utmost publicity but should be couched in such terms as to deal a smashing rebuke to those who have seen fit to utilize the government as an advertising asset. If this is done, consumption-cure fakers may, in the future, hesitate to follow Duket's course.

In the meantime, Duket, by carefully selecting his cases so that the "treatment" is given only to those who in the ordinary course of events may be expected to live for four or five years at the least, will have accomplished what he seeks. And the medical college which is standing sponsor for him will have obtained much free advertising. And the unhappy consumptive is all this time paying the bill in blasted hopes—a refinement of cruelty that is a disgrace to a civilized community.

Association News

THE MINNEAPOLIS SESSION

Golf Club Courtesies—Details of Special Trains

The Minneapolis Number of THE JOURNAL, May 10, gave full particulars about the Minneapolis session, the programs, hotels, railroad rates, excursions, meeting places, etc.

GOLF OPPORTUNITIES

The various country clubs situated around Minneapolis will offer the use of their golf links to golf enthusiasts who may be attending the American Medical Association convention and may desire a game.

Cards may be secured by writing the chairman of the Committee on Arrangements, Dr. F. C. Todd, Donaldson Building, Minneapolis, or by inquiring at the Bureau of Registration during the meetings.

GREAT WESTERN TRAINS

The following special trains are announced on the Great Western, the details concerning which were not ready for announcement in the Minneapolis Number:

From Chicago.—"The Journal Special" will leave Grand Central Depot, Harrison and Fifth Ave., 6:40 p. m., Monday, June 16, arriving at Minneapolis, 8:00 a. m. the following day.

"The Rochester Special" will leave at 6:30 p. m. Sunday, June 15, arriving Rochester, 6:30 a. m., the following day. Convention tickets are good via Rochester with stop-over without extra charge.

From Kansas City, St. Joseph and Des Moines.—"The Southwest Medical Special" will leave Kansas City at 1:45 p. m., Sunday, June 15, St. Joseph, 4:00 p. m., Des Moines, 9:20 p. m., arriving Minneapolis, 7:45 a. m., the following day.

From Denver.—"The Colorado Special" will leave Denver via the Union Pacific road at 3:00 p. m., June 15, and from Omaha via the Chicago Great Western at 7:00 a. m., Monday, June 16, arriving Minneapolis same evening.

From Omaha.—"The A. M. A. Train" will leave Omaha at 8:20 p. m., Monday, June 16, arriving Minneapolis, 8:00 a. m., June 17.

For details and reservations, members can consult any representative of the road.

Correspondence

Request for Embryologic Specimens

To the Editor:—The embryologic collection at the Johns Hopkins Medical School has now grown sufficiently large to be of great value to the medical profession. Over one hundred special papers on various topics in human embryology are based on this collection, and it is for this reason that I again appeal to physicians for more abortion specimens to help along the studies in this subject. Not only does this collection prove to be of value in the study of the anatomy of the human embryo, but it also sheds light on the cause of abortion, a question which concerns very much the general practitioner. In every hundred pregnancies there are about twenty abortions, among which there are seven pathologic ova and one monster. The clinical histories in these cases show that some sort of uterine disease produces the abortion, and for this reason it seems plain that the pregnancies would have resulted in normal births had the uterus been normal. Therefore from a practical point of view it is important to study the cases clinically as well as normal and pathologic development of ova and embryos.

Substantial financial aid has been secured to study human embryology on a large scale, and to do this successfully much more material with good clinical histories must be collected. A number of studies are under way, the successful termination of which is dependent on the intelligent cooperation of physicians in active practice.

The collection is not only preserved in a fire-proof building, but it is also given every possible attention by a competent staff of scientific and technical assistants. The histories, notes, drawings and photographs are also carefully preserved. As occasion demands specimens bearing on the various phases of the subject—ovulation, implantation, diseases of the uterus and ovum, and serial sections of normal and pathologic embryos—are distributed to competent investigators elsewhere. Every attention is also given to physicians sending specimens, so that they depend on this "clinical laboratory" for gratuitous expert advice.

As the types of pathologic ova found in tubal pregnancies differ from those obtained from the diseased uterus, which in turn differ markedly from those of lower animals, there is every reason to hope for information which bears on the cause of monsters, of sterility and possibly the study of eugenics. These subjects as well as the anatomy of embryos interest us now, but to make headway in this study we must procure many specimens and they can be obtained only through the cooperation of physicians in active practice.

Those who are interested in this embryologic project are asked to send to us all abortion material which they secure in their practice. Practically perfect material is obtained when the fresh specimen is fixed as soon as possible, without cutting the membrane, in a large quantity of 10 per cent. dilution of liquor formaldehydi in water. It should be floated in this fluid and should never be forced into a bottle or wrapped in cotton.

When placed in a bottle completely filled with the formaldehyd solution, the condition of the specimen imitates that of the fetus in utero, and the specimen may be safely sent by express. Fill up the bottle before shipping it; if there is no air space it is almost impossible to injure the embryo by shaking it.

Send all specimens to the undersigned at the Johns Hopkins Medical School.

FRANKLIN P. MALL, M.D., Baltimore.

American Surgical Association Desires Articles on Fractures

To the Editor:—The Committee on Fractures of the American Surgical Association desires to have two reprints of any paper dealing with the non-operative or operative treatment of open or compound fractures or the medicolegal relations of roentgenography to the diagnosis and treatment of fractures which has been published within the last five years. If authors have no reprints, the committee would be pleased to receive memoranda of the places of publication.

JOHN B. ROBERTS, M.D., Chairman,
313 South Seventeenth St., Philadelphia.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

CRITICISM OF THE PRESCRIPTION OF A CONSULTANT

To the Editor:—A consultant in a case of chorea due to rheumatism supplements an arsenic and bromid course of treatment by the following directing the tablets to be used to overcome insomnia:

℞ Lupulin
Scutellarin āā gr. ss
Ergotin
Macrotin āā ¼ gr.
Hyoscyamin sulph. 1/1000 gr.
Zinc bromid 1/10 gr.
(Tablets as prepared by Upjohn Co.)

I shall be glad to see THE JOURNAL'S comment on this prescription.

1. Should an ordinary druggist be prepared to fill this without depending on the ready-made stocks of the larger pharmaceutical houses?

2. If the formula is a useful one, could not a framework be constructed that would lend itself to the needs of a physician well acquainted with the action of each individual ingredient, and

desiring to modify the proportions of each in accordance with the needs?

3. Does it not seem a singular coincidence that the doctor (whom the patient's family look up to as a leader of his profession) should find this precise formula exactly suited to this case?

4. What will be the separate and combined action of the six ingredients in the doses given?

5. What should be the attitude of the attending physician toward a consultant displaying such profound pharmacologic erudition?

6. Is there any comment he can reasonably make to the parents of the patient? W. R. T.

ANSWER.—There is no need of argument as to the impropriety of such a prescription, for it would puzzle any pharmacologist to explain its physiologic or therapeutic action, if it has any.

1. Any druggist ought to be able to fill the prescription, although some of the products named, such as scutellarin, for example, are of uncertain composition and may not be in his stock.

2. The utility of the prescription is not sufficient to make it worth while to produce any model framework to be varied at the judgment of the practitioner. Surely the intelligent practitioner will be able to meet all the indications of an ordinary case with a more scientific prescription, one less on the shotgun order.

3. We fail to find any indication of a "coincidence" in the incident as presented by our correspondent. It was once thought that hops, from which lupulin is derived, was an efficient and harmless remedy for insomnia. This seems to be the ingredient of the formula which probably suggests its use in insomnia as a routine pill for such patients. A "pet formula" is not in itself objectionable, but a physician must always be careful in using it. This caution is specially needed in a consultation in which the consultant is called as an expert to assist in a given case. The attendant evidently feels that in this instance the prepared pill proves that the consultant failed to consider carefully the problem presented in the particular patient. An intelligent and sympathetic cooperation in the interest of the patient between the attendant and the consultant will result in a course of treatment adapted to the individual case.

4. The action of ergotin, hyoscyamin and zinc bromid can be found in any up-to-date treatise on pharmacology. The action, as well as the potency, of the other ingredients is very uncertain. Except as the drugs complement each other as a sedative, the action of the combination is an unanswerable question.

5. The patient is under the care of the attendant, who should be governed by his own opinion as to whether or not harm is being done the patient. If not, he can conscientiously overlook the failures of the consultant, as he hopes that the consultant will overlook his own. If, however, he believes that the patient is not receiving proper treatment, the attendant should firmly but courteously insist on the course that he considers best. There will seldom be serious difference if the treatment is fully discussed by two physicians, both of whom have their interest centered in the welfare of the patient. If, by any chance, the attendant and the consultant cannot agree, a third physician, selected by the patient, should be called into the conference. Should it not be possible to arrange for this additional consultant, the first consultant should withdraw from the case.

6. Usually, it is unnecessary and unwise to make any comment to the patient or the parents concerning a difference between the physicians, other than to state frankly that the attendant is assuming entire responsibility for the treatment. Should the progress of the case be unsatisfactory and the patient become dissatisfied, the attendant should withdraw, leaving the patient entirely free to select a physician to direct the future treatment, even though it is probable that the patient's choice will be the previous consultant.

EFFECT OF SILVER NITRATE PROSTATIC INJECTIONS—ACTION OF TANNIC ACID ON URETHRA

To the Editor:—1. Have injections of nitrate of silver into the prostatic urethra ever been followed by abscess of the seminal vesicles, prostatic abscess or such a hemorrhage as to necessitate an external urethrotomy?

2. Have insufflations or saturated solutions of tannic acid been used as a topical application to the prostatic urethra? If so, have such complications followed as blood-poisoning, abscess of the seminal vesicles or abscesses of the follicles of the prostate gland, caused by the tannin coagulating the albumin of the tissues and forming an insoluble albuminate and so blocking up the ejaculatory and prostatic ducts? SUBSCRIBER.

ANSWER.—1. Silver nitrate injections used in sufficient strength (over 5 per cent.) to act as a corrosive might produce necrosis of tissue, and abscess formation with hemorrhage, although not of a grade so severe as to necessitate external urethrotomy.

2. Tannic acid, in saturated solution or insufflated, is of itself so powerful an astringent that this action would have a tendency to close up ducts and sinuses, but it would not unite with the albumin of the tissues to produce an insoluble albuminate. Such a compound could only be formed with the free mucus in the prostatic urethra. There is no reason why tannic acid in full strength should be used as a topical application to the posterior urethra.

SKIN DISEASES AND CLEANLINESS IN INSTITUTIONS

To the Editor:—In a large institution for children, in spite of unusual precautions as to isolation, use of individual towels, bubbling cups, etc., we have been unable to prevent the spread of skin and other contagious diseases.

Would you consider it of any advantage to add calcium hypochlorite to the water used in scrubbing floors, beds, etc., or to the water in the bathing-tank? M. M.

ANSWER.—The reason that all sorts of minor skin diseases are so prevalent in large institutions, in spite of all efforts of precaution, is that children, like animals, are indifferent to dirt, and therefore are dirty. They have no hesitation, also, about using each others' things, so that infectious diseases become the common possession of many. Nothing but complete isolation and constant surveillance will prevent them from using each others' hats, combs, drinking-cups and other such things, and it is by these personal articles that infections are usually spread. In addition, children's skins are very sensitive and particularly vulnerable to pus infections and infections by the common parasites such as lice and ringworm. All these factors make it almost impossible to prevent infections in children who are thrown together in large schools or large institutions.

The addition of calcium hypochlorite would be of little or no advantage for the purpose mentioned. For scrubbing floors, beds, etc., it would be much better to use 1 : 1,000 solution of corrosive sublimate with an equal quantity of a similar solution of hydrochloric acid. There is no antiseptic which could be used in sufficient strength in a swimming-tank to be effective. The best thing to do with that is to have the tank supplied with fresh water, to keep the youngsters from wallowing over each other, and to see to it that they use individual towels and do not get their clothes mixed. Shower-baths should also be provided and each person compelled to take a shower-bath with soap before going into the tank.

LITERATURE ON FLUID-CORE GOLF-BALLS

To the Editor:—Please let me know what literature there is in regard to eye injuries resulting from cutting open golf-balls containing acid or other sight-destroying compounds.

G. I. HOGUE, M.D., Milwaukee, Wis.

ANSWER.—The following may be referred to:

Wood, C. A.: Burns of Eyeball from Contents of So-Called "Water-Core" Golf-Balls, *Ophth. Rec.*, October, 1912.
Nance, W. O.: Severe Burn of the Eye from Contents of Fluid-Core Golf-Ball, *Jour. Ophth. and Oto-Laryngol.*, November, 1912.
Carpenter, J. T., and Baer, B. F.: Inflammation of Eye Resulting from Explosion of Golf-Ball, *Pennsylvania Med. Jour.*, December, 1912.
Crigler, L. W.: Burn of Eyeball Due to Caustic Contents of Golf-Ball, THE JOURNAL, April 26, 1913, p. 1297.
Water-Core Golf-Balls, editorial, THE JOURNAL, April 26, 1913, p. 1307.

INSURANCE COMPANY ASKING SUPPORT OF PHYSICIANS

To the Editor:—I have been solicited to buy shares in the Royal Life Insurance Company, head offices 108 South La Salle Street, Chicago, at $30 per share. In the event of my buying shares I was to be appointed associate medical director and be the examiner for the county in which I reside. As a further inducement I was told that one-half of the mortuary savings would be divided among the associate medical directors. The company will begin to write its business June 15. Can you give me any information regarding this company or its prospects for the future? S. J. M.

ANSWER.—There have been similar inquiries regarding this company from other sources. In some it is said that the

proposition to invest came subsequent to appointment and acceptance by the physician.

A condition precedent to an insurance company's doing business in Illinois is the deposit with the state insurance department of $100,000 for the protection of policy-holders and the further requirement of law as to a reserve. In other states insurance regulations must be complied with. None of these conditions has, we understand, been met. Radical departure from other customs in insurance business rests in the fact that it is proposed to issue policies from each state, and any bank or banker will be "authorized to act as claim agent." The "sop" to the doctor is thrown in the plan to have districts in every state with associate medical directors and medical examiners, who must be stockholders, to supervise and assist agents and who, as further reward, will share in 50 per cent. of the "mortality savings," according to their holdings of stock.

Roseate estimates of what can be done are given in the prospectus, of which an expert in life-insurance says: "It is full of misleading statements as to the returns an investor is likely to receive." Like nostrum exploitation, it promises too much on the panacea order. The plan proposed is so involved, hazy and withal embryonic that it will not appeal to the careful physician.

COBRA VENOM TEST FOR SYPHILIS COMPARED WITH THE WASSERMANN REACTION

To the Editor:—What is the value of the cobra venom test for syphilis as compared with the Wassermann test?

F. L. WILHOIT, M.D., Louisville, Ky.

ANSWER.—This test appears to be less sensitive than the Wassermann test in parasyphilitic affections and in syphilis of the nervous system. In general the present evidence tends to show that it is not so reliable as the Wassermann reaction, although it may be serviceable in confirming it, or possibly in complementing it in latent cases. It should be remembered, however, that the test has not yet been applied to a sufficient number of cases to permit very definite conclusions to be drawn.

Medical Economics

THIS DEPARTMENT EMBODIES THE SUBJECTS OF POST-GRADUATE WORK, CONTRACT PRACTICE, LEGISLATION, MEDICAL DEFENSE, AND OTHER MEDICOLEGAL AND ECONOMIC QUESTIONS OF INTEREST TO PHYSICIANS

MEDICAL ORGANIZATION IN ENGLAND

From time to time during the last two years, THE JOURNAL has discussed the development of medical organization in Great Britain and the changes consequent on the discussion and adoption of the Lloyd George national insurance act. The provisions of this law and its effect on medical men and the public were freely discussed prior to its final adoption. Owing to the unsatisfactory terms of compensation and other objectionable provisions, the British Medical Association at first refused to endorse the measure and called on its members to refuse to accept service under it. Later on, however, it was found impossible to retain a united front on this question, so that the opposition of the organized medical profession in England has gradually been withdrawn. It has been predicted in all quarters, however, that the passage and effective operation of this law would produce important and far-reaching changes in professional conditions in England. This prediction is apparently borne out by the increasing amount of discussion in the leading British medical periodicals, of the advisability of reorganizing the medical profession on a trade-union basis. This discussion has apparently reached a climax in a recent issue of the *British Medical Journal*, which contains, as its leading editorial, a discussion of "Trade-Unionism and Medicine," as well as a special article discussing the subject from a legal point of view.

The special article is unsigned and therefore is evidently prepared by the editorial staff of the *Journal*. According to the writer, at the annual representative meeting, held at Liverpool last year, the question of the establishment of a medical union, registered under the trade-union acts, was discussed. The solicitor of the association stated that the legal difficulties in the way of converting the British Medical Association into a body which could come under the provisions of the trade-union acts were considerable. Future discussion of the question was postponed until the next annual meeting. In the meantime, however, a medical union was organized in Leicester, which has since obtained recognition under the trade-union acts, while another body, known as the National Medical Guild, has been organized and has applied for registration under the same acts. Eleven of the fourteen members of the council of the latter organization are residents of London.

These developments have led to a lively discussion in British medical journals on the relation between trade-unionism and medicine. The plan of organization and method of conduct of trade-unions in Great Britain is carefully prescribed in the trade-union acts. One of the most important questions for determination in this connection is the limitations of powers and privileges under such a plan of organization. The primary object of the trade-union is to make the terms of service, including the remuneration of all persons concerned, reasonably good and so to maintain them, while an ancillary object is to assist the members in defending their rights and help them to make better provisions for their welfare. Most, but not all, of the disputes in which trade-unions have engaged have turned on the question of compensation. A medical union must be prepared to deal with unreasonable or improper demands unduly increasing the labors and responsibilities of its members, and with attempts to reduce just compensation for services. It must have the power to defend its members individually, as well as its own acts collectively. The criticism which has been made against the existing organization of the British Medical Association is that its powers and resources for collective and individual defense are inadequate and that its control over its members is insufficient to insure effective action. This is admitted by the most loyal members of the association. To assume from this, however, that a medical trade-union is the only alternative or the best solution is a long step and one which cool-headed members of the association will want to consider very carefully before taking. The article endeavors to put the question in the form of a syllogism, as follows: "An effective union of the profession is desirable. A union registered under the trade-union acts is an effective union. Therefore the organization of a medical union under the trade-union acts is desirable." This statement, the writer says, would be water-tight if a union registered under the trade-union acts were the only effective union possible. As an alternative proposition, he suggests the organization of a union which shall be registered under the companies acts; in other words, the formation of a corporation rather than of a trade-union.

After quoting at length from the trade-union acts of different years, the membership provisions of the recently organized Leicester union are discussed. The objects of this organization are given as follows:

1. To regulate the relations and conduct of medical practitioners as between themselves, and between medical practitioners and their employers.

2. To regulate the rates of payment and condition of service of clubs, friendly societies, dispensaries and other forms of contributory contract practice, and the terms and conditions on which medical service shall be given to persons of limited income.

3. To impose any other restrictive conditions which may be considered desirable on the conduct, by members of the union, of the trade or business of medical practitioners carried on by them.

To further these objects, the Leicester union has adopted the following methods: the establishment of funds for the promotion of a public medical service for persons unable to pay, the promotion of school clinics for the treatment of children unable to pay, the giving of legal assistance to members, the promotion of legislation for the protection of the

union and for the general and material welfare of its members, the advising of members in ethical matters, the promotion of the interests of the medical profession, the general amalgamation of other bodies having similar objects and the establishment of branches and subdivisions. There is an entrance fee of one guinea ($5.25) and annual dues of the same amount.

The rules of this organization forbid any member to consult with or meet any medical practitioner who does not conform to the rules of the union, to take or treat any patient at a lower rate than that prescribed by the union, to act for any insurance committee, society or organization which does not conform to the rules of the union, or to canvass or advertise for patients. Any member found guilty of conduct detrimental to the honor and interests of the union, or calculated to bring the business, trade and profession of the medical practitioner into disrepute, is subject to expulsion.

The National Medical Guild, in addition to the objects set forth by the Leicester Union, provides for the employment of the funds of the guild for political objects, for insurance of members against death, illness or damages, for the publication of books and periodicals to further the ends of the guild and for the acquirement of such property as may be necessary.

Comparison of these objects with the powers of the British Medical Association under its present charter raises the question, "What can a trade-union do for medical men that a voluntary association cannot do?" The advantages from a legal point of view do not seem conclusive. The real power of the trade-union depends on three points: (1) its ability to include so large a majority of persons engaged in one calling that the minority will be negligible, as far as influence is concerned; (2) the constancy of its members in abiding by the regulations of the union, as decided by the majority; (3) the power of the union, in the event of failure to come to an amicable agreement with employers, to induce its members to refuse to work until satisfactory conditions are secured.

On the first point, a trade-union would have no advantage over a voluntary association. The proportion of persons in any one calling who would affiliate with such an organization would depend on the successful management of the organization rather than on the exact form which the organization might take. The power of the trade-union as compared with a corporation in Great Britain is practically the same.

On the second point, the constancy of members to the organization will depend entirely on the benefits which the organization provides for its members. The hold which trade-unions have on their members lies in the fact that a tradesman who leaves his union forfeits his rights to the benefits which it offers, while the power which a union has over its members in case of dispute with employers is based on a sense of loyalty to one's associates, as well as the fear of losing any benefits involved or the fear of social or professional ostracism.

Perhaps the most significant sentence in the special article is found in the closing paragraph, in which the writer says, "Every one realizes that the insurance act will have the effect of increasing rather than diminishing the need for an effective system of professional defense against encroachment by the government, by friendly societies and other forms of contract practice, and by individuals." An explanation of the present situation of the medical profession in Great Britain is to be found in the opinion, here expressed by the official organ of the British Medical Association, that the government and society at large are not affording the medical profession fair or equitable treatment or just compensation for their services and that united action on the part of physicians is necessary.

Commenting editorially on this article, the *Journal* says that there is danger, in the existing situation, of mistaking the means for the end. The end is a united profession, unanimously seeking certain objects. Because a similar end has been the goal of trade-unionism, it does not necessarily follow that trade-unionism is the only means by which such an end can be secured. Dr. Cox, the president of the North of England branch, discussed this question in an address in 1907, in which he stated that in those trade-unions in which he had been able to secure information, the amounts paid out by the members for organization and for protective purposes only, apart from sick and benevolent benefits, amounted to from an eightieth to a fortieth of the member's total annual income, and that one explanation of the results secured by trade-unionism in Great Britain was that the members were willing to work for and pay for the results desired. Three courses are open to the medical profession in the present situation. These are (1) to obtain a charter from the crown, (2) to register under the companies act or (3) to register under the trade-union acts. The British Medical Association at present is registered under the section of the companies act which permits registration of an organization which does not trade for the profit of its individual members. This provision is eminently similar to the law in force in many of our own states, providing for the incorporation of organizations not for profit.

In 1907 the British Medical Association applied for a crown charter, but the application was refused. The editorial concludes: "The strength of trade-unionism lies not in the formation or laws, but in the union and solidarity it has bred. This solidarity it has brought about partly by encouraging the growth of a feeling of fellowship among men engaged in the same calling and partly by politicly making the growth of this feeling keep pace with the material interests of the individual members. The proposal to form a medical union or unions is one which needs to be threshed out."

It will be noted that neither the writer of the special article nor the writer of the editorial attempts any positive opinion on medical trade-unionism. Discussion of this question in England has been precipitated by the recent passage of the Lloyd George national insurance act. This measure was brought about by a large number of complicated social causes and conditions, with most of which the medical profession had nothing to do. In order to improve the condition of the British workingman and his family, to relieve pauperism and improve social conditions, Lloyd George decided that it was necessary for the state to furnish protection for the workingman against avoidable disease and incapacity caused by illness. The assumption, on the part of the state of the responsibility for the medical care of working men is clearly a step in the direction of state socialism. In formulating his plan for this measure, Lloyd George consulted the interests and wishes of all classes involved, except the medical profession, which, under his plan, was to furnish the services necessary for the care of those included in the scheme for industrial insurance. When the first draft of the bill was made public, the terms of compensation and service provided for physicians were seen to be so unfair and inadequate that an immediate storm of protest arose from the medical profession. Unfortunately, however, due partly to the commercializing of the British medical profession through friendly societies, medical clubs and other forms of what is generally termed "contract practice," as well as through the fact that the organized medical profession had for years made little or no effort to educate the public as to its objects or the character of its work, the profession was left to fight its battle practically alone, with little or no public support. Unable to hold its members in line on the program agreed on, it was practically forced, after a long and bitter struggle, to take what it could get in the way of compensation and conditions of service. The unionizing of the medical profession is one of the remedies now proposed as a relief for the economic evils with which the profession is threatened.

The experience and the present situation of our British professional brethren are and should be most instructive to American physicians. The principal lessons which can be drawn therefrom are the avoidance of any form of contract practice or similar arrangements which tend to commercialize the medical profession and, equally important, the cultivation of the closest possible relations with the people so that the growing importance of the work of the medical profession may be understood and appreciated and the support of the public secured in carrying out its higher aims.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

DELAWARE: State Society and Homeopathic, Dover and Wilmington, June 17-19. Secretary of the Medical Council, Dr. Henry W. Briggs, 1026 Jackson St., Wilmington.

IOWA: Capitol Building, Des Moines, June 2-4; State University, Iowa City, June 5-7. Sec., Dr. Guilford H. Sumner, State House, Des Moines.

KANSAS: Topeka, June 10. Sec., Dr. H. A. Dykes, Lebanon.

KENTUCKY: Armory, Louisville, June 3-5. Sec., Dr. J. N. McCormack, Bowling Green.

LOUISIANA: New Orleans, June 5-7. Sec., Dr. A. B. Brown, 108 Baronne St., P. O. Box 1060.

MARYLAND: Regular, 1211 Cathedral St., Baltimore, June 17. Sec., Dr. J. McP. Scott, Hagerstown; Homeopathic, Baltimore, June 13-14. Sec., Dr. O. N. Duvall, 1817 N. Fulton Ave.

MICHIGAN: Ann Arbor, June 10-12. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

MINNESOTA: Pathological Laboratory State University, Minneapolis, June 3. Sec., Dr. Thomas McDavitt, Lowry Bldg., St. Paul.

MISSISSIPPI: Capitol Bldg., Jackson, June 3-4. Sec., Dr. E. H. Galloway.

MISSOURI: Gymnasium of St. Louis University, St. Louis, June 16-18. Sec., Dr. J. A. B. Adcock, Jefferson City.

NEBRASKA: Lincoln, May 28-29. Sec., Dr. C. P. Fall, Beatrice.

NEW JERSEY: Capitol Bldg., Trenton, June 17-18. Sec., Dr. H. G. Norton, 429 E. State St., Trenton.

NEW YORK: June 24-27. Chief of the Examinations Division, Harlan H. Horner, Department of Education, Albany.

NORTH CAROLINA: Morehead City, June 12. Sec., Dr. Benjamin K. Hays, Oxford.

OHIO: Columbus, June 2-5. Sec., Dr. George H. Matson, State House.

SOUTH CAROLINA: Columbia, June 10. Sec., Dr. A. Earle Boozer, 1806 Hampton St.

TEXAS: Austin, June 4-6. Sec., Dr. W. L. Crosthwait, Suite 1110 Amicable Bldg., Waco.

VIRGINIA: Richmond, June 24-27. Sec., Dr. Herbert Old, Norfolk.

WYOMING: State House, Cheyenne, June 25-27. Sec., Dr. J. B. Tyrrell, Laramie.

Oklahoma April Report

Dr. J. W. Duke, secretary of the Oklahoma State Board of Medical Examiners, reports the written examination held at Oklahoma, April 8-9, 1913. The number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 70. The total number of candidates examined was 11, including two osteopaths, all of whom passed. Eight candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Birmingham Medical College	(1911) 83; (1912)	79
College of Physicians and Surgeons, Little Rock	(1911)	70
College of Physicians and Surgeons, Los Angeles	(1912)	77
Rush Medical College	(1908)	88
Northwestern University Medical School	(1912)	81
Medical College of Indiana	(1898)	80
Barnes Medical College	(1905)	79
Memphis Hospital Medical College	(1911)	79

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Birmingham Medical College	(1911)	Mississippi
University of Louisville	(1911)	Kentucky
University of Nashville	(1905) Mississippi; (1909)	Tennessee
Lincoln Memorial University	(1910)	Tennessee
Memphis Hospital Medical College	(1911)	Tennessee
University of the South	(1900) (1908)	Tennessee

The following questions were asked:

OBSTETRICS AND HYGIENE

1. When do you use ergot in obstetric practice, and for what purpose? 2. Give in their order the three most common presentations. 3. How long can the child live before delivery with the placental circulation cut off? What precautions should be used to prevent compression of the cord in breech presentation? 4. What symptoms would cause you to suspect a rupture of the uterus? How would you manage a case? 5. What are the stages of labor? 6. Define abortion, miscarriage, premature labor. 7. Define puerperal septicemia. Give diagnosis and treatment. 8. What precautions would you use to prevent inflammation of the mammary glands? Give in detail your treatment of mammary abscess. 9. Give instructions for the prevention of the spreading of typhoid. 10. Is cerebrospinal meningitis contagious? If so, how are the germs conveyed?

BACTERIOLOGY AND PATHOLOGY

1. What is acute miliary tuberculosis? Name three varieties of tubercle. 2. Name the lesions usually found in the second and third stages of syphilis. 3. What is hypertrophy of the heart? Give three causes for same. 4. How would you diagnose croupous pneumonia from catarrhal pneumonia by microscopic examination? 5. Name three ways by which you can determine whether a certain organism is or is not pathogenic. 6. How would you make a bacteriologic examination of water suspected of fecal contamination? 7. Name a simple method of producing a pure culture of the typhoid bacillus. 8. Name three malarial parasites and the kind of malaria caused by each parasite. 9. Name three pathologic changes that may result from cerebral hemorrhage. 10. Name three pathologic changes that take place in peritonitis.

GYNECOLOGY

1. Differentiate fibroid, pregnancy, ascites, fat. 2. Diagnose and treat tuberculous endometritis. 3. Give indications for and technic of operation for amputation of cervix. 4. Give indications for and technic of trachelorrhaphy. 5. Make diagram showing relation of uterus, tubes, ovaries, vagina, bladder and rectum. 6. Differentiate pudendal hernia, abscess of Bartholin's gland, and tumor of labia. 7. Describe venereal warts. Give etiology and treatment. 8. Vulvitis. Give etiology and treatment. 9. Give indications for knee-chest posture in office treatment. 10. Give indications for use of hot vaginal douche.

MATERIA MEDICA AND THERAPEUTICS

1. State the sources and dose of salicylic acid. 2. Describe the therapeutic uses of glycerin. 3. Name four principal coal-tar derivatives and give physiologic action. 4. Name the principal potassium salts. Give dose and use of each. 5. Name three vegetable and three mineral astringents with dose of each. Treat the following diseases, giving doses of drugs used, their therapeutic effect, diet and prognosis: 6. Typhoid fever. 7. Pneumonia. 8. Pellagra. 9. Cerebrospinal meningitis. 10. Scarlet fever.

TOXICOLOGY AND MEDICAL JURISPRUDENCE

1. Describe how subterranean wounds may be produced. How many kinds of open wounds? Name them according to the way they are produced. 2. How does electricity produce death? 3. Give some of the conditions simulating death. 4. Name some peculiarities of some of the special senses which would furnish important evidence in relation to identity. 5. Give some of the symptoms of organic nervous diseases. 6. How does chloral hydrate produce death? Name lethal dose. 7. How does chloroform produce death? 8. What are the important symptoms of poisoning by digitalis? 9. By what method of examination would you ascertain that a person was suffering from a fatal dose of quinin? 10. How does antipyrin produce death?

PHYSIOLOGY

1. Define physiology. 2. Tell the functions of the third, fourth and fifth cranial nerves. 3. What is the function of the uterus? 4. What is the function of the portal vein? What veins form it? 5. What is an enzyme? 6. Describe reflex action. 7. What is the function of the lymphatic system? 8. Tell the distribution and function of the pudic nerve. 9. Describe the cardiac cycle. 10. What nerves form the solar plexus?

PHYSICAL DIAGNOSIS

1. Describe the general method of palpation. 2. In what condition should the examiner's hands be before applying them? 3. What regions are studied by a simultaneous application of both hands? 4. What condition may cause total abolition of fremitus? 5. When is palpation of vocal fremitus of most practical value? 6. What does splashing fremitus signify when felt against the thoracic wall, shaking the body? 7. How many attributes of percussion sounds; name them. 8. Describe artificial vocal resonance (plegophonia). 9. Describe Broadbent's sign in inspection. 10. What is learned by percussion when we have simultaneous extension of the area of cardiac dulness toward both sides and upward of the pericardial sac?

ANATOMY

1. Give the origin and distribution of ulnar nerve. 2. Describe the sternum. 3. Locate saphenous opening and name an important vessel passing through it. 4. In disease of upper chest why is there frequently pain on inside of upper arm and about the shoulder? 5. How do the ventricles of the brain communicate with each other and with the subdural space? 6. Give a rule for locating the fissure of Rolando. 7. Name the arteries supplying intestinal tract from pylorus to anus. 8. Describe arrangement of gray and white matter in spinal cord. 9. Describe method of division and termination of capillary bronchial tubes. 10. Name a racemose gland. Describe its structure.

CHEMISTRY

1. Give the antidote for carbolic acid. For formaldehyd. 2. Give the chemical composition of iodoform. 3. How does permanganate of potassium act as a disinfectant? 4. What is the toxic agent in ptomains? 5. What is the formula of sulphuric acid? 6. Give the method of urinalysis for albumin and sugar. 7. Would you use iodin on the skin after a mercuric solution? 8. What is the law of Avogadro? 9. What is the antidote for arsenic? 10. What is chemistry?

SURGERY

1. What are the varieties of ankylosis? 2. Give symptoms and treatment of fractures of the nasal bones. 3. State the most common seat of fracture of the clavicle and describe a method of treatment. 4. Describe the treatment for fracture of lower end of the humerus. 5. Describe a modified circular amputation of the leg. 6. What are the indications for excision of the knee-joint? 7. How are wounds classified? 8. Give a full description of the operation for thyroidectomy. 9. Give the indications for the removal of the mammary gland. 10. Describe an operation for circumcision.

Russian Move Against Opium.—It is reported that the Russian Department of Agriculture has prepared a law prohibiting the culture of the poppy plant in the Transbaikal, Amur, and Maritime provinces. According to this law, not only the cultivation of the poppy will be a criminal offense, but also the smoking of opium, storing or purchasing it, as well as the purchasing of utensils used for smoking opium.—Vice-Consul H. Fred Newhard, Vladivostok, in the *Daily Consular Reports*

Medicolegal

New Rule Announced for Canned Goods

(Bioclow vs. Maine Central Railroad Co. (Me.), 85 Atl. R. 396)

The Supreme Judicial Court of Maine holds that, on the assumption that the plaintiff was made sick by eating canned asparagus furnished her by the defendant company in its dining car, the defendant was not liable in damages therefor, in the absence of an express warranty. What duties the law may impose on manufacturers of food products, which turn out defective, the court does not assume to decide.

The court says that of little less importance than the appearance of the great achievements of the last century is the establishment and development of the canning industry in this country and in other parts of the world. It may be said that the art of canning, if not invented within the last century, has, at least, assumed the vast proportions which it has now attained, within a comparatively few years. It involves a unique and peculiar method of distributing, for domestic and foreign use, almost every product known to the art of husbandry.

The wholesaler, the retailer and the user of these goods, whether in the capacity of caterer, seller or host, sustain an entirely different duty, respecting a knowledge of their contents and quality than prevails with regard to knowing the quality of those food products which are open to the inspection of the seller or victualer. With reference to these it may well be considered, as has been held, that having an opportunity to investigate, and thereby to know the quality of their merchandise, they are charged with a responsibility amounting to a practical guaranty.

But, on such a state of facts as this case presented, a situation arises that cannot in the practical conduct of the canning business fall within that rule. No knowledge of the original or present contents of a perfect appearing can is possible in the practical use of canned products. They cannot be chemically analyzed every time they are used. Accordingly, the reason for the rule having ceased, a new rule should be applied to the sale and use of canned goods that will more nearly harmonize with what is rational and just.

The statement of facts before the court showed that the asparagus served to the plaintiff was of a very high brand, sold by a most reliable firm, guaranteed under the pure food law, and without fault or blemish discoverable to the eye, to the smell, or taste. It was apparently a perfect can of what it purported to contain. The plaintiff in February must have known it was a canned product when she ordered it. On her order she was entitled to a reputable brand, packed and inspected in accordance with approved methods, and the law implied a warranty on the part of the defendant to furnish it. This obligation was fully met.

Evidence Supporting Conviction of Unlawfully Practicing Medicine

(Mueller vs. State (Tex.), 153 S. W. R. 1142)

The Court of Criminal Appeals of Texas affirms a conviction for unlawfully practicing medicine, with a penalty of a fine of $100 and twenty-four hours in jail. The court says that the uncontradicted evidence clearly showed that Mueller, by his public advertisements in newspapers, and to others, publicly offered to practice, and professed to be able to cure practically any and all diseases, and invited all afflicted to call on him for that purpose; but in his advertisements and in his talk to many of his patients he would tell them specifically he made no charge. In his advertisements he stated, "Positively no charges made, but the labor is worth the hire," and repeatedly stated this to some of his patients. However, the evidence disclosed that numerous of his patients, whom he did treat, paid him indirectly. One paid to his wife in his presence; others by doing work for him; others by making him or his wife presents; another by renting him a house and collecting no rent for several months. To one he prescribed medicine and furnished it. Others paid him money directly for his treatment of them. One witness, whom he treated repeatedly and for some time, stated that, in discussing the treatment and his charges, he said: "'I won't charge you anything [I don't know how many times he said that], nothing; but, if you make me a present, it is welcome.' . . . I made him a present; it was in money. Sometimes I would hand him $1, and sometimes $2 or something like that. I never told him, 'Here is your money.' I just put it in his hand, and he never looked at it. He just put it in his pocket." It was also shown that he called himself "Dr. Mueller," and was generally known and called "Dr. Mueller," and that was the title he gave himself. He was shown not to have any license registered. The evidence clearly justified the verdict.

When the state offered to prove by the editor of a newspaper, and to introduce Mueller's published advertisements therein, showing that he professed to cure any and all diseases, and inviting everybody afflicted to come to him for treatment, he objected, because such advertisement did not show that he was practicing, or offering to practice, medicine, and that in said advertisements he did not claim to be a physician or practitioner of medicine belonging to any school, and he expressly stated in said advertisements that he made no charge. In his advertisements, he called himself "Professor" Mueller; but the whole of it showed, and showed only, that he was offering to practice, and the testimony by the witnesses showed that he did actually practice, medicine on men, women, and children, and that was his profession. The evidence was admissible.

Society Proceedings

COMING MEETINGS

AMERICAN MEDICAL ASSOCIATION, MINNEAPOLIS, JUNE 17-20

American Academy of Medicine, Minneapolis, June 13-15.
Amer. Medico-Psychological Assn., Niagara Falls, Can., June 10-13.
American Proctologic Society, Minneapolis, June 16-17.
Maine Medical Association, Portland, June 25-26.
Massachusetts Medical Society, Boston, June 10-11.
New Jersey Medical Society, Spring Lake, June 10-12.
North Carolina State Medical Society, Morehead City, June 17.
Rhode Island Medical Society, Providence, June 5.
South Dakota State Medical Association, Vermillion, May 27-29.

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS

Ninth Triennial Session, held at Washington, D. C., May 6-7, 1913

(Concluded from page 1570)

The Life of Tissue Outside the Organism from the Embryologic Standpoint

DR. ROSS G. HARRISON, Yale University, New Haven: The method I have used in my observations is that of the "hanging drop culture." In the study of neuroblasts I have found that the nerve fiber is not the outgrowth of the cell, but is formed from the protoplasmic bridge which exists everywhere in the organism between the cells and cannot be isolated. I thought I would try to see what the nerve-cell did when there is no protoplasm. The parts of the central nervous system of the embryo were dissected out and then transplanted into a drop of lymph on the cover-slide. Transplanted to lymph this tissue undergoes changes in the course of a few days and spreads out and flattens because of the liquefaction of the lymph, and many cells wander out from the tissue. I then watched what took place in the nerve-cells. I also took portions of various other tissues of the embryo. I found that cells from the epidermis differentiated cilia; the pavement cells differentiated queerly. After twelve hours, it can be noted that the nerve fibers have grown out a long distance. These fibers come from isolated cells. I watched the character of the movements for six hours at intervals of eight minutes and found that the movements were very rapid —about 1 micron per minute. To show that they are real

nerve fibers, I have used the specific stain which shows neurofibrillae. It is a specific nerve tissue without doubt. The protoplasmic activity has formed nerves. If we cut off these fibers there is a regeneration of the peripheral parts. In order to produce a perfect reproduction of the tissue we must keep the tissue alive as long *in vitro* as it would have lived in the organism from which it was taken. If the tissue has been taken from an animal that lives on an average four years, then we should be able to keep the tissue alive for that length of time. This method, while producing cell division and multiplication, has failed to show any form development; the growth remains simply a mass of cells.

In discussing the effect of the medium on growth and differentiation we find that the tissues are differentiated in salt solution, but we have need of solid support or there is no movement of the cells and no growth. If nerve fibers are on a solid support when they leave the cells, this may be a visible chemical process. This brings me back to the nerve problem, and it seems evident that the protoplasmic bridges referred to are between the fibers forming the support. The results we have obtained show that this method is applicable to the study of embryonic cell movement and differentiation.

The Life of Tissues Outside the Organism from a Pathologic Standpoint

DR. ROBERT A. LAMBERT, New York: Those of us who are directing our energies to problems relating to the nature and cause of disease are interested in the new methods of growing cells apart from the organism mainly on account of its possible application to the study of the various morbid processes affecting the human body. The new method offers several very definite advantages in that it allows one to observe directly under the microscope changes taking place in living functioning isolated cells, thus making it possible to pursue with ease many questions in the field of pathologic histology, the solution of which has seemed to wait on the discovery of a technic of this kind. In the second place, it permits us to eliminate many factors which in experiments on the animal body are a source of much confusion, as, for instance, nervous control. In the third place, the isolation of some single factor for the purpose of special study is made possible. In the fourth place, we are able to introduce more easily into an experiment known and measurable factors, such as change in the physical and chemical composition of the medium, introduction of specific toxins and poisons, variations in temperature, etc. It is obvious that not all problems having to do with the activities of cells are open to attack by these methods, since not every tissue can be made to grow *in vitro* up to this time. The number of tissues that can be successfully cultivated is not inconsiderable, including connective-tissue cells, bone, cartilage, endothelium, skin and corneal epithelium, intestinal epithelium, malignant tumors and possibly also thyroid and kidney epithelium. Certain cells, such as ganglia cells, seem to survive, though they do not proliferate. The problems which present the most fruitful field of application may be classified under three headings: (1) morphologic questions; (2) questions in immunity, including cancer immunity, cellular and bacterial immunity; (3) problems relating to the cultivation and study of the viruses of certain infectious diseases, especially those in which the specific intracellular bodies have been described.

Cytotoxins are easily demonstrable in tissue cultures, and cancer immunity is not a type of cytotoxic immunity. In my experiments on the question of cytotoxin specificity two series of guinea-pigs were immunized, respectively, with rat sarcoma and rat embryo skin. Plasma from each series of animals was used for cultures containing both kinds of tissue. These experiments show that sarcoma may immunize completely against skin and vice versa. There is no evidence of even a relative specificity. Red blood-cells will immunize against other tissues.

Another field of pathologic investigation in which this new method may be applied is the study of viruses and specific lesions of infectious diseases in which the living agent has not yet been identified, as rabies, vaccinia, variola and measles. In association with Dr. Steinhardt and Dr. Poor I have made efforts at studying rabies and vaccinia. We have tried to see if Negri bodies would show any development or multiplication *in vitro* when fragments of brain from rabid animals were incubated in blood-plasma. No development or multiplication of Negri bodies in rabid brain cells took place *in vitro*, so far as we could determine. We found, however, that in the control preparations in which normal brain alone was incubated, the same structures also appeared. In the latter case the bodies certainly represented some degenerative changes in the brain-cells. Therefore we regarded our results as favoring the idea that the Negri body is not a parasite, but a specific cell degeneration.

The Life of Tissues Outside the Organism from the Physiologic Standpoint

DR. MONTROSE T. BURROWS, New York: There is no line between the morphologic and the physiologic aspects of this subject. The object in growing tissues outside of the body is that they may be observed in the living condition; this cannot be done by Loeb's methods. In 1910 I began to study cultures with the idea of developing a method which would be applicable for practical experimental purposes. Lymph has hitherto been used as a culture medium, but this can be obtained only in small quantities, and its consistency is not always constant. I therefore turned to blood-plasma as a promising medium and prepared fibrin from the blood of chickens. My observations confirmed the results that Dr. Harrison reported. I think that it would be a good idea to test the applicability of these methods to adult tissues. My observations include experiments on the tissues of dogs, cats, rats, guinea-pigs and man. Tissues from all of these sources grow luxuriantly, except those from man. The human plasma went into solution at once. There are some small growths in the case of human tissue, but only a few. The undue liquefaction of the medium leads to the early death of the tissue. Practically all other tissues cause liquefaction in varying degrees, but it takes place slowly.

I have experimented with the chick embryos in many liquids. They grow rapidly in isotonic sodium chlorid solution of various strengths, and the growth is prolonged and increased by the addition of potassium chlorid. The growth is the same as that in a wound. The connective-tissue cells grow as isolated cells in the surrounding medium. The growth in each variety of cell is characteristic of its kind. The nerve-cells appear as axis cylinder cells, the blood-cells as amebic cells. The growth depends on the medium and is oftener greater in weak solutions than in strong ones. Adult striated muscle succumbed, but embryonic muscle wandered, divided and differentiated. The growth keeps in an inactive state as long as six months. To effect this preservation, the tissue is placed in a drop of plasma and the whole tightly sealed. If there is sufficient medium the tissue will retain its life for a long time.

This field offers a prospect of reproducing every form of cellular activity seen in the body. Wound-healing has been imitated by culture through the movement of epithelial cells. If two portions of tissue are placed near one another in the medium, each will send out cells toward the other and the tendency will be for the cells to fill the intervening space. Harrison has called attention to the need of solid body support to the growing cells. Contact with the cells, unless violent, does not stimulate movement. A single cell in a culture medium tends to move away and liquefy from a large mass rather than from a small one. All movement is due to a chemical process. Given the diameter of a wound, by the application of the principles of cell proliferation I can predict the form of healing. It has been suggested that by an application of a certain theory wounds may be made to heal in a few hours. Practically, it does not happen in so short a time. The fibrin lying between the edges of the wound is too thick and contracted in proportion to the amount of fibrin present. Cell development begins only when the cells cease to wander and locate in a clot. It is better to have a colony of cells in the culture medium as this pro-

duces sufficient liquefaction to provide nutrition. There are amebic movements at the poles of cells accompanying cleavage at the equator; these movements are due to external influences, but division is due to internal forces.

I have also experimented with the heart-muscle cell. The question as to what causes the heart to beat has long been discussed, and two theories have been advanced, the myogenic or automatic, and the neurogenic. The heart-cells are free from all nerve-cells, and it is found that they continue to beat rhythmically. This seems to me to be conclusive evidence of the truth of the myogenic theory.

DISCUSSION

DR. LEO LOEB, St. Louis: The methods I have used are based on the same principles as those related, but I have used larger pieces of tissue and have put them into a tube. This has the advantage over the cover-slip method that it enables us to study the gases and yeast and to eliminate the leukocytes. I have found that it is possible for transplanted tissue to grow without an outgrowth of cells so long as it is in contact with a solid or semisolid substance. If two pieces of tissue are placed near each other the cells grow toward each other. Different tissues act differently in the plasma; for instance, the tissues of the guinea-pig absorb the plasma and they will be found to be growing when one has supposed them to be dead. Epithelium does not grow so well as connective tissue. My experiments with a long series of transplantations have led me to believe in the potential immortality of ordinary cells.

DR. WARREN H. LEWIS, Baltimore: We have been growing tissues in known mediums, such as sodium chlorid, calcium chlorid and sodium bicarbonate. We find that in varying percentages of sodium chlorid, tissues migrate and mitosis takes place in such simple solutions as those from 0.5 to 1.5 per cent. of sodium chlorid without difficulty. A high-percentage solution causes delay of the cell activities. The saline solution offers the advantage over the plasma in that it does not cling to the cover-glass and one can study the living nerve on glass. It can be seen that the processes anastomose freely with other fibers so that a true network is formed, and stains show that the neurofibrillae pass from one nerve fiber to another. Mitosis is very frequent with various solutions. I have studied the subject of fat in the cells and the relation of fat in the cells to that in the mediums. I find that the first cultures never contain fat, but I have been able to produce cultures in which the accumulation of fat is so enormous that the cell structure is practically obliterated. Rejuvenation by transplantation can be reduplicated in artificial mediums to which cane-sugar or dextrose has been added, and the occasional addition of a fresh drop of the medium doubles the time of life and growth. The growth is striking after the addition of alcohol or ether, but not if there is more than 2 or 3 per cent.

Book Notices

INNERE SEKRETION. Ihre physiologischen Grundlagen und ihre Bedeutung für die Pathologie. Von Prof. Dr. Artur Biedl, mit einem Vorwort von Hofrat Prof. Dr. R. Paltauf. Second Edition. Part One. Paper. Price, 26 marks. Pp. 534, with 151 illustrations. Berlin: Urban & Schwarzenberg, 1913.

The first edition of Biedl's splendid compilation of the literature, and his own experience on the glands of internal secretion, appeared in 1910. The early appearance of the new edition demonstrates how much need there was for such a work, and how well supplied the need was. But this is more than a new edition—it is an entirely new work; for while the entire book in its first edition was but about 400 pages, the first volume alone of the second edition contains 130 more. The author seems to have felt that in his first work the limited use of space prevented him from going into the detail which the unsettled state of many of his problems really demanded for their presentation. The need for explanation by means of illustrations has been filled by twenty colored plates and a great number of black-and-whites. In this volume, which follows in arrangement the first half of the original edition, are covered the thyroid, parathyroids, thymus and adrenal, and related subjects. There can be no question that the work, which from the start has been the best thing of the kind available, is greatly increased in value by its augmented inclusiveness, and is made much easier of understanding and of greater educational worth by the abundant illustrations. It will be used as the first source of information concerning the ductless glands, since it is the one extensive and modern collection of the latest developments of this growing and interesting part of medical science. Furthermore, it is much more than a compilation, for Biedl himself being an active investigator in this field, has analyzed the work of others with the judgment and insight which only those who are themselves familiar with the methods and difficulties of research can possess. It is to be hoped that the second volume of this monograph will soon appear, for since there is no bibliography in this it is to be assumed that that essential part of the work will be placed at the end.

THE EVIL EYE, THANATOLOGY, AND OTHER ESSAYS. By Roswell Park, M.D., LL.D. Cloth. Price, $1.50 net. Pp. 380. Boston: Richard G. Badger, 1912.

Under this title Dr. Park has published thirteen essays, addresses, etc. The first and the one from which the title of the book is taken, is an address delivered before the Buffalo Society of Natural Sciences; it is a discussion of old superstitions regarding malign influences, witchcraft, etc. The second is the paper on "Thanatology," published in THE JOURNAL last year (April 27, 1912), which caused no little discussion in the lay press. Among the other essays are "Serpent-Myths and Serpent Worship;" "Iatro-Theurgic Symbolism;" "Relation of Grecian Mysteries to the Foundation of Christianity;" "The Knights Hospitalers of St. John of Jerusalem;" "Giordano Bruno;" "Student Life in the Middle Ages;" "Study of Medical Words," "Deeds and Men," etc. They are all historical in character, and while not strictly medical are on the border-land of medicine sufficiently to make the book of special interest to physicians.

THE CHEMICAL CONSTITUTION OF THE PROTEINS. By R. H. A. Plimmer, D.Sc., Assistant Professor of Physiologic Chemistry, University College, London. Second Edition, Part Two. Cloth. Price $1.20 net. Pp. 107. New York: Longmans, Green & Co., 1913.

This is the second edition of one of this valuable set of monographs, the individual numbers of which we have reviewed and recommended as they appeared. We are glad that they have met such support as to warrant the production of new editions to keep up to date the subjects they cover. The first edition is but a little over three years old, so that even in the rapidly growing field of protein chemistry the work has not had time to grow stale and valueless. We note with pleasure that in reviewing the progress of protein chemistry during the last three years in his preface, the author finds worthy of recording as the chief items of this period, in addition to the work of the master, Emil Fischer, and his old assistant, Abderhalden, the contributions of three American chemists, T. B. Osborne of New Haven and D. D. Van Slyke and P. A. Levene of the Rockefeller Institute.

DISEASES OF THE THROAT, NOSE AND EAR. For Practitioners and Students. By W. G. Porter, M.B., B.Sc., F.R.C.S., Surgeon to the Eye, Ear and Throat Infirmary, Edinburgh. Cloth. Price, $2.50. Pp. 275, with 77 illustrations. New York: William Wood & Co., 1912.

In compact form this book offers clear, concise descriptions of affections of the nose, throat and ear with which the general practitioner daily comes in contact, and gives sufficient suggestions as to management and treatment to make it a good working guide. It is well printed and well illustrated, and in an appendix contains formulas for various washes, sprays, insufflations, etc., which may be useful as routine measures, or serve as suggestions which may be modified to suit particular cases.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Insanity, Baltimore

April, LXIX, No. 4, pp. 643-834

1 Diffuse Glioma of Pia Mater. A. M. Barrett, Ann Arbor, Mich.
2 *New Formation of Nerve Cells in Isolated Part of Nervous Portion of Hypophysis-Tumor in Acromegaly with Diabetes. A. Meyer, Baltimore.
3 *Brain in Case of Catatonic Hirntod. S. T. Orton, Worcester, Mass.
4 *Series of Normal-Looking Brains in Psychopathic Subjects. E. E. Southard, Worcester, Mass.
5 *Case of Large Endothelioma of Frontal Region of Brain. R. L. Whitney, Worcester, Mass.
6 Curability of Insanity. A. I. Noble, Kalamazoo, Mich.
7 Case of Epilepsy. E. V. Scribner, Worcester, Mass.
8 Personality and Outcome in Two Hundred Consecutive Cases. E. D. Bond, Hathorne, Mass.
9 Polyneuritic Delirium—Korsakoff's Psychosis. W. C. Sandy, Trenton, N. J.
10 Two Interesting Cases of Melancholia. C. A. Porteous, Montreal, Can.

2. **New Formation of Nerve Cells.**—Meyer summarizes his paper very briefly as follows: The change in the hypophysis in acromegaly seems to be more uniform than the descriptive terms in the literature would suggest. The differences of opinion may be due in part to a limitation of the examination to one or few portions of the tumor. The change found in their cases is identical with that described by Brooks. It shows also the mode of propagation of the tumor. In a sequestrated part of the nervous portion unmistakably new formation of nerve-cells with Nissl-bodies has occurred, beside other monstrosities.

3. **Brain in Catatonic Hirntod.**—The case cited by Orton is one of a psychosis of acute onset followed by death within fifteen days and showing at autopsy neither gross nor microscopic visceral alterations of sufficient intensity to be regarded as factors in the disease or cause of death. Clinically the diagnosis is not definite on account of the short time of observation and the condition of the patient, but the limited data place it probably as a case of dementia praecox of the katatonic form. Sections stained with thionin and by the Bielchowsky method yielded findings which might be the result of post-mortem disintegration, but which in the case of the thionin specimens at least were probably *ante mortem* in occurrence. In specimens stained by the Herxheimer and osmic acid methods considerable amounts of lipoid materials were found in the ganglion cells, glia cells and phagocyte cells of the perivascular spaces. By Alzheimer's Methods IV and VI ameboid glia cells with a variety of granules were found widely scattered throughout the brain in the lower layers of the cortex and particularly in the subcortical white matter.

4. **Series of Normal-Looking Brains.**—That forty-two persons dying insane at ages between 76 and 91 exhibit intact brains on the autopsy table presents a significant problem in Southard's opinion. Many pathologists would wonder whether the brains of normal seniles should not exhibit some traces of atrophy, at all events in the higher eighties. And it would be only natural to suppose that the wear and tear of brains in the insane should lead to still greater atrophic changes. The assigned diagnoses in this senile group of subjects insane but intact of brain were: senile dementia, 32; paranoic conditions, 3; alcoholic conditions, 2; imbecility, 1; essential dementia, 1; manic-depressive insanity, 1; epileptic insanity, 1; delirium, 1. There were twenty-two deaths of insane with intact brains aet. 71-75. The diagnosis in these cases were: senile dementia, 7; other diagnoses, 15. Southard's general conclusion here is that four or five patients whose brains looked "normal" to the anatomist were with a certain probability abnormal (whether morbid or merely anomalous should not be risked). Gross pathologic anatomy, he says, has still to prove that senile dementia, as the term is used, is attended with any considerable loss of brain substance in large group of instances. The Worcester State Hospital series of autopsies in cases of mental disease, 1895-1911, numbered 740. The brains of 249 of these subjects, or about one brain in three, are recorded as of normal appearance on the autopsy table.

A somewhat larger Danvers State Hospital series, similarly studied, had yielded something like one brain in four as of normal appearance in the gross. As these normal-looking brains stand the best chance of corresponding with the so-called functional cases of mental disease, some effort has been spent on classifying the group from certain viewpoints, particularly those afforded by previous studies in the Danvers series. Brains should perhaps be considered normal until proved abnormal, even if they belong to the subjects of mental disease. A review of the possible groups of normal-looking brains found in insane subjects leads Southard to the supposition that there may be a certain group of such which will fail to show any lesion whatever: there may theoretically, perhaps, exist brain-structures which, whereas intfinsically normal, are extrinsically abnormal. There is actually a higher percentage of senile psychoses in the normal-brain series, viz., 32 per cent., than in the abnormal-brain series, viz., 20 per cent. A less inevitable frailty of diagnosis is shown by these statistics in that patients over 75 years of age at onset are far more apt to receive the diagnosis senile dementia than those just under 75 years of age. After 75 the diagnosis senile dementia is surely too facile.

Another odd fact (at least in Southard's view, who had supposed manic-depressive insanity might prove exceedingly "functional" and to have brains only extrinsically abnormal) is the fact that one in four of the manic-depressive brains was in some respect grossly abnormal, whereas none of the forty-two brains in dementia praecox exhibited gross abnormality. The main object of this communication is to stimulate interest in normal or normal-looking brains in psychopathic subjects, so that the question whether insanity is, or is not, always a matter of structural brain-disease may approach settlement. Incidentally the question has arisen whether dementia praecox may not on the ground of viability be divided into dementia praecox brevis (with early death, say under two years from onset; katatonic form often here found) and dementia praecox longa (in which the subject dies, as a rule more than eight years after onset, of a variety of causes; katatonic form less frequent). Use has been made of a principle that apparent normality of brains may be consistent with fine microscopic changes, possibly of a reversible nature, and that we shall hardly from gross appearances be able to assert abnormality of brains unless at least three months (preindurative period) have elapsed from the onset of some cell-destructive process. Use has also been made of a principle to the effect that various nerve cells which are in all respects intrinsically normal may be essentially sharing in processes extrinsically abnormal.

The hypothesis is raised that the whole cortex, or even the whole nervous system, might be intrinsically normal but extrinsically abnormal in its reactions to a given chemical, physical or other condition. Southard suggests that it is possible that the solution of the problem of the functionality of various diseases might be to consider the structures involved as intrinsically normal whereas extrinsically abnormal—the normal operation of various cells leading to injurious effects in the organism as a whole. It seems clear to Southard that the general statement "insanity is brain-disease" is well-nigh meaningless unless the particular structures thought to be involved are specified, since it is clear that science has not discovered even the right place to look in certain diseases (no more in mental disease than in certain forms of, say, diabetes).

5. **Large Endothelioma of Brain.**—Whitney's case is that of a large endothelioma of the frontal region of the brain located chiefly in the right frontal lobe but also extending into the left frontal lobe. The pathologic findings are compatible with a tumor of slow growth. The patient from boyhood possessed special attainments. Fifteen years ago he suffered a nervous breakdown resulting in retirement from an active professional life. Subsequently there occurred periods of lethargy, depression and loss of ambition with

final incapacity for self-support. Beginning with a transitory period of unconsciousness, various neuro-muscular disturbances were apparent which were followed by apathy, somnolence and progressive mental deterioration, which symptom complex in the absence of thorough neurologic examination led to the diagnosis of general paralysis.

Archives of Ophthalmology, New York

May, XLII, No. 3, pp. 227-344

11 Use of Vaccines in Eye Infections. J. G. Dwyer, New York.
12 Herpes Iris of Conjunctiva, with Report of Case. H. Barkan, San Francisco.
13 Another View of Extraction in Capsule Cataract Operation. C. B. Meding, New York.
14 Contribution to Pathology of Hemorrhagic Glaucoma. J. Stähli, Zurich, Switzerland.
15 Pathogenesis and Therapy of Facial Eczema in Children (from Standpoint of Pediatrist). F. Goeppert, Göttingen.

Archives of Pediatrics, New York

April, XXX, No. 4, pp. 241-320

16 *Infant Feeding and Examination of Stools. F. B. Talbot, Boston.
17 Hemorrhagic Conditions in Children—Pathology—Etiology—Treatment. A. L. Soresi, New York.
18 *Unique Case of Congenital Scoliosis. J. Fraser and J. W. L. Spence, Edinburgh.
19 Milk Stations or Infant Mortality. L. V. Waldron, Yonkers, N. Y.
20 Abortive Types of Small-Pox. L. A. Sexton, New York.

16. Infant Feeding and Examination of Stools.—The following table is given by Talbot as a synopsis of the stool findings as applied to infant feeding:

Symptoms of Indigestion	Due to	Shown by Vomitus and Stools
Vomiting Regurgitation	Fat	(a) Creamy vomitus (b) Stools containing (1) Soft curds (2) Soap stools a. Clay-like b. Dry, crumbling (3) Oily stool, col. of Indian meal
Gas in stomach with or without discomfort. Failure to gain or loss of weight on food containing insufficient calories. Gas in Bowels Colic	Carbohydrate	(a) Watery, sour vomitus (acid) (b) Stools (1) Acid, scalding (2) Feathery, bubbly (3) Starch stains blue with Gram's solution
Loss of appetite Fever or subnormal temperature Poor appetite Frequent or undigested stools	Protein	(a) Cheesy vomitus (b) Stools containing tough curds

Physical examination must, he says, rule out disease in other parts of the body and the milk must be absolutely clean. Infections of the gastro-intestinal canal are not considered in this classification. Talbot believes, however, that the normal saphrophytic bacteria play some rôle in the processes of digestion. The symptoms of indigestion may be practically the same in fat, sugar or casein indigestion, and it is, therefore, obvious that the symptoms alone do not tell what is the cause of the indigestion. The necessary information must be obtained from what can be seen, *i. e.*, from the vomitus and the stools. The information obtained from inspection of the vomitus is not very accurate and is frequently only confirmatory. Creamy vomitus, in absence of other data, suggests too much fat in the food; watery acid vomitus, too much sugar, and cheesy vomitus, too much casein. These characteristics usually are confirmed by the stool findings. The stools give the most accurate data, but attention should not be focused on them to the exclusion of other factors which may be equally important. Stools which apparently are not perfectly digested should not be a reason for changing the formula of a baby that has no symptoms of indigestion and is thriving and happy—for example, a breast-fed baby. It would be unwise to diminish the food of any baby unless it had some of the symptoms enumerated in the table.

18. Case of Congenital Scoliosis.—The seventh and eighth dorsal vertebrae in this case were incomplete. On the right side there were half vertebrae and each half tended to be wedge-shaped. On the left side the two vertebrae had fused into a single wedge-shaped bone. The last dorsal vertebra was divided into two halves by a mesial division, but the shape of each half was more or less preserved. In the lumbar region of the spine the first three lumbar vertebrae were incomplete, the right halves were present and each was distinctly wedge-shaped. On the left side the vertebrae had become two separate bones, an oval bone equal in depth to the body of a healthy vertebra, and a small wedge-shaped bone lying more anterior. On the left side there were thirteen ribs and possibly a suspicion of a fourteenth. The ribs of the left side corresponding to the seventh, eighth and ninth dorsal vertebrae had become fused about one inch from the side of the vertebral column into a single broad rib; and this single rib articulated with the vertebral column by two short processes. One of these processes was attached to the ninth dorsal vertebra, the other to the wedge-shaped remnant of the seventh and eighth vertebrae.

Archives of Roentgen Ray, New York

April, XVII, No. 11, pp. 411-450

21 Method of Treating Carcinoma of Esophagus. W. Stewart, New York.
22 Case of Lymphosarcoma Treated by Radium. D. F. D. Turner, Edinburgh.
23 *Influence of Various Contrast Substances on Motility of Intestinal Canal. F. Groedel, Bad-Nauheim.
24 Some Experiments with Ionic Medication. N. S. Finzi, London.
25 *New Unit of Roentgen-Ray Power. S. Tousey, New York.

23. Motility of Intestinal Canal.—Barium sulphate is held by Groedel to be the best contrast material for roentgenoscopy of the stomach. He uses a barium porridge containing 250 grams of barium sulphate, 20 grams of maize flour, 20 grams of sugar, 20 grams of cocoa and 400 c.c. of water. His data are as follows: Stomach emptied: one and a half to two hours after the meal. Cecum begins to fill: one to one and a half hours. Cecum filled: two to six hours (right flexure). Transverse colon filled four and a fourth hours (left flexure). Rectal ampulla reached twenty-four hours at latest. These figures show that with barium sulphate the stomach empties itself just twice as fast as with bismuth.

25. New Unit of Roentgen-Ray Power.—The proposed new unit to which Tousey has given his name—the Tousey unit—is the x-radiance which produced on an ordinary photographic film an effect equal to that of 1 candle-power of incandescent electric light. With x-radiance of medium penetration this gives a guide to accurate therapeutic dosage and correct exposure in radiography. Twenty Tousey-meter-seconds of No. 7 Benoist is equal to one Holzknecht unit. The measuring film is prepared in the following manner: A piece of film, 2½ by 3½ inches, is placed in a black envelope in which there are two covered apertures. Each of these is uncovered separately, and each aperture is exposed to 1/10 candle-power-meter-second of incandescent electric light. In the author's laboratory this has to be done at night with a 4 candle-power light at a distance of 14 meters for five seconds. A number of these films are prepared beforehand and kept in their black envelopes in readiness for making a test. For this purpose the four corners of the film are given four different exposures to the Roentgen rays measured in meter-seconds, the rest of the film being covered by a lead shield. The entire film is developed at the same time and in the same solutions, thus avoiding the difficulties of standard developers and variations of temperature. The development should last ten minutes in a strong developer, so as to be sure to develop the entire thickness of the film. Stopping the development shortly after the appearance of the image gives an entirely misleading ratio between Roentgen-ray and electric-light sensitiveness. The intensity of the Roentgen-ray light is determined by comparing the dark patches on the film. For

example, two meter-seconds (two seconds at 1 meter, or eight seconds at two meters, or half a second at ½ meter) of Roentgen radiance has the same photographic effect as 1/10 meter-second of electric light. The Roentgen-ray effect is evidently twenty times weaker, and the Roentgen-ray power on the focus-tube is said to be 1/20 Tousey.

Boston Medical and Surgical Journal

May 8, CLXVIII, No. 19, pp. 673-712

26 Diagnosis of Tuberculous Character of Joint Disease. E. G. Brackett, Boston.
27 Infantile Beriberi in Philippines. D. Gregg, Boston.
28 *Cholecystitis and Cholelithiasis Associated with Pregnancy: Report of Two Cases. R. M. Green, Boston.
29 Diffuse Sub-Dural Lipomatosis of Spinal Cord in Infant. S. B. Wolbach and J. A. P. Millet, Boston.
30 Abuse of Roentgen Rays in Treatment of Skin Affections. J. T. Bowen, Boston.
31 *Statistical Study of Remissions in General Paralysis. H. L. Paine, Danvers, Mass.

28. **Cholecystitis and Cholelithiasis Associated with Pregnancy.**—From a study of two cases and of those previously reported in the literature, Gregg draws the following conclusions:

1. That there seems to be a definite causal association of cholecystitis and cholelithiasis with pregnancy. 2. That symptoms due to either of these conditions may occur during pregnancy, during puerperium following labor at term, or after miscarriage. 3. That the existence of gall-bladder disease is not in itself a cause of miscarriage, but that miscarriage may induce the development of active symptoms from a process previously latent. 4. That cholecystitis or cholelithiasis occurring during convalescence from miscarriage should receive the same surgical treatment and bear the same prognosis as in cases not associated with pregnancy.

31. **Remissions in General Paralysis.**—Of 420 unselected and consecutive cases of general paralysis admitted to the Danvers State Hospital during a period of thirty-four years, Paine says, only one case with a history of a paralytic seizure showed a remission, and only six cases with a history of any form of cerebral insult showed a remission. Inversely then, Paine states, it may be said that if a case of general paralysis in its early stage has a paralytic seizure, the chances are very small that that case will have a remission.

Bulletin of Johns Hopkins Hospital, Baltimore

May, XXIV, No. 267, pp. 135-166

32 Evolution of Thyroid. D. Marine, Cleveland.
33 *Hypersensitiveness to Tuberculo-Protein and to Tuberculin. C. R. Austrian, Baltimore.
34 Ancient Office of Coroner. D. I. Macht, Baltimore.
35 Dr. Ephraim McDowell, "Father of Ovariotomy": His Life and Work. A. Schachner, Louisville, Ky.

33. **Hypersensitiveness to Tuberculo-Protein and Tuberculin.**—Austrian's experiments confirm the already demonstrated facts that (1) a protein substance can be obtained by the extraction of tubercle bacilli with water, and with it animals can be actively sensitized, (2) that a refractory condition to this protein can be produced, and (3) that the hypersensitive condition is transmitted from mother to young. His experiments establish further that active sensitization induced by treatment with this protein may be as regular in its development and as intense in its manifestations as is that produced by treatment with other proteins. Passive homologous and heterologous hypersensitiveness can occasionally be produced with the blood or with the serum of an actively sensitized animal. The material transmission of the hypersensitiveness does not take place through the milk. The regularity with which maximum hypersensitiveness can be produced is largely dependent on the use of a sufficient amount of protein in preparing and in testing the animals. All the manifestations of typical hypersensitiveness to protein can be produced in guinea-pigs by treatment with aqueous extracts of tubercle bacilli. Guinea-pigs can be sensitized with albumose-free tuberculin and with old tuberculin that has been freed of glycerin and made poor in salts. And sensitization with any of these products causes the animal to react to injections of the others.

Hypersensitiveness to tuberculin develops within seven to fifteen days after infection with the *B. tuberculosis*. Tuberculous animals can occasionally be intoxicated with tuberculoprotein, developing symptoms of hypersensitiveness. The passive transference of hypersensitiveness from a tuberculous man to normal guinea-pigs has been successfully accomplished by Austrian and positive results have likewise been obtained when the serum of a sensitized animal has been injected into an untreated one. The type of the reaction symptoms and the development of them in an infected host after the administration of minimum doses of tuberculin are likewise suggestive facts. Austrian is of the opinion that this evidence justifies the interpretation of the tuberculin reaction as a manifestation of true hypersensitiveness.

Journal of Abnormal Psychology, Boston

February, VII, No. 6, pp. 385-452

36 Psychoanalytic Study of Severe Case of Hysteria. L. E. Emerson, Boston.
37 Psychogenic Disorders in Childhood. T. A. Williams, Washington, D. C.
38 Mental Manifestations of Epilepsy. N. S. Yawger, Philadelphia.

Journal of Biological Chemistry, Baltimore

May, XIV, No. 4, pp. 335-431

39 New Method of Isolating Trypsin. H. L. Holzberg, San Francisco.
40 Conditions Affecting Formation and Excretion of Formic Acid. H. D. Dakin, N. W. Janney and A. J. Wakeman, New York.
41 Relative Influence of Weak and Strong Bases on Rate of Oxidations in Unfertilized Egg of Sea Urchin. J. Loeb and H. Wasteneys, New York.
42 Further Metabolism Experiments on Parathyroidectomized Dogs. I. Greenwald, New York.
43 Phosphorus Content of Blood of Normal and Parathyroidectomized Dogs. I. Greenwald, New York.
44 Researches on Purines. C. O. Johns and E. J. Baumann, New Haven, Conn.
45 *Excretion of Nitrogen Subsequent to Ligation of Successive Branches of Renal Arteries. J. D. Pilcher, Cleveland.
46 *Iodin and Phosphorus Contents, Size and Physiologic Activity of Fetal Thyroid. F. Fenger, Chicago.
47 Utilization of Ammonia in Protein Metabolism. A. E. Taylor and A. I. Ringer, Philadelphia.
48 Studies in Purine Metabolism: Uricolysis in Human Subject. A. E. Taylor and W. C. Rose, Philadelphia.
49 Glyoxalase. H. D. Dakin and H. W. Dudley, New York.

45. **Nitrogen Excretion after Renal Ligation.**—Pilcher found that ligation of one of the branches of both renal arteries, *i. e.*, approximately half of the blood supply, does not cause any noticeable disturbance in renal function. The urine and the nitrogen excretion remained practically normal, with a slight tendency to nitrogen retention. Successive complete ligation of one renal artery and one branch of the other (*i. e.*, shutting off three-fourths of the arterial supply) resulted in marked temporary prostration, anorexia and loss of weight, with nitrogen output much greater than the intake. The animals recovered gradually to a condition similar to that when but one-half of the arterial supply was ligated. On the assumption that the ligated areas took no part in urine formation, the remaining one-fourth of the kidney was able to secrete the urine almost as effectively as the entire kidney area. Occlusion of one branch of the renal artery did not result in sufficient collateral circulation from the capsule to preserve the function of the ligated area; so that even after twelve months it was unable to preserve life if the renal artery was then ligated. With but one-fourth of the kidney substance functioning the quantity of urine was practically normal; the urine containing no albumin or casts; cardiac hypertrophy did not occur.

46. **Fetal Thyroid.**—In two previous communications Fenger showed that fetal thyroid tissue possesses a strong selective affinity for iodin, that the glands of beef fetuses contain an appreciable amount of iodin as early as the third month of intra-uterine life, or approximately six months before maturity, and that the iodin content increases proportionately with the age of the fetus. It was also conclusively demonstrated that the presence of active principle in a gland is an indication of its relative physiologic activity and that consequently the fetal thyroid is functionally active long before maturity of the fetus. No further definite conclusions could be drawn at that time because of the lack of raw material. During the past year at various seasons the glands from 705 beef fetuses six to nine months old were analyzed by Fenger within a short time after collection. The iodin content of the normal-sized

fetal thyroids during the last three months of intra-uterine life seemed to be fairly uniform throughout the various seasons. Normal fetal glands are relatively larger and contain more iodin and phosphorus per unit of body weight than thyroids from fully mature animals. The normal female fetal thyroids show a higher content of iodin and seem, therefore, to possess greater functional activity than the male fetal glands. Fetuses possessing enlarged thyroids, on the whole, were considerably smaller than average fetuses of the same age with normal thyroids. The enlargement of fetal thyroids exceeds, both in frequency and size, the number of goitrous-affected glands of fully mature animals and is apparently, according to Fenger, the consequence of insufficient supply or faulty assimilation of iodin on the part of the pregnant animal. Enlarged glands in general, both fetal and adult, contain less total iodin and much more total phosphorus than normal thyroids.

Journal of Cutaneous Diseases, New York

May, XXXI, No. 5, pp. 305-376

50 Case of Acanthosis Nigricans. H. G. Klotz and G. L. Rohdenburg, New York.
51 Extensive Tuberculosis Cutis with Death from Pyemia: Report of Case. H. K. Gaskill, Philadelphia.
52 Some Details in Wassermann Technic. A. W. Stillians, Chicago.
53 Dermatologic Therapeutics. C. W. McMurtry, New York.

Journal-Lancet, Minneapolis

May 1, XXXIII, No. 9, pp. 249-273

54 Etiology, Diagnosis and Treatment of Acute Infections of Pleura and Lungs. L. A. Nippert, Minneapolis.
55 *Rectal Section for Pelvic Abscess in Men. A. MacLaren, St. Paul, Minn.
56 *Treatment of Septic Endocarditis. S. P. Rees, Minneapolis.
57 Technic of Anesthesia. G. E. Putney, Paynesville, Minn.

55 and 56.—Abstracted in THE JOURNAL, Sept. 7, 1912, pp. 824 and 825.

Journal of Outdoor Life, New York

May, X, No. 5, pp. 129-158

58 Compensations of Illness. H. H. Murphy, Kamloops, B. C.
59 Distractions of Leisure. F. Davies, Saranac Lake, N. Y.
60 Childhood Infection and Its Relation to Adult Pulmonary Tuberculosis. W. C. Bailey, Boston.
61 Tuberculosis in State Legislatures. P. P. Jacobs.

Medical Record, New York

May 10, LXXXIII, No. 19, pp. 829-874

62 Consultations without Scars. J. D. Bryant, New York.
63 Osteitis Deformans (Paget's Disease). W. G. Thompson, New York.
64 *Functions of Pineal Gland. C. L. Dana and W. N. Berkeley, New York.
65 Salvarsan in Cryptogenetic Pernicious Anemia. C. E. Nammack, New York.
66 Dissolved Albumin Test for Gastric Cancer. F. W. Rolph, Toronto, Ont.
67 Cystic Polypus in Nasal Pharynx of Child. E. A. Griffin, Brooklyn.
68 Case of Exophthalmic Goiter Cured by Roentgenotherapy. S. Tousey, New York.

64. **Functions of Pineal Gland.**—The experiments carried out by the authors were the following: 1. The nucleoproteids and entire pineal gland extracts were obtained and injected into the veins to test the effect on the blood-pressure. 2. They were also injected into young animals—rabbits, guinea-pigs—for a long time to determine the effect on nutrition. 3. The whole gland was fed to young animals. 4. The whole gland was fed to defective and retarded children. Since the beginning of the summer of 1911 the investigation has been confined almost entirely to feeding experiments. The authors fed the gland to guinea-pigs and rabbits, and to certain selected children, if possible under 8 or 9 years and to children who seemed to be cases of simple retardation without notable anatomic defect and without epilepsy. Children in the retarded grades of the public schools were used for this purpose as well as private cases at the New Jersey Training School for the Feeble-Minded at Vineland, New Jersey. The gland was fed to twenty-one children, watching these and comparing them with twenty-one controls. The work was carried on for nearly eight months.

The authors state their provisional conclusions as follows: The pineal gland is the vestigium of a special sense organ of vision in invertebrates and certain low vertebrates. In man it has practically lost all the structural characters of a sense organ and has those of a glandular body. It undergoes some involution at about the seventh year of life. They are strongly of the opinion that in the early period of life it has influence over bodily nutrition, including the development of the genital organs, the deposit of subcutaneous fat, general growth and mental progress. They find that the extract of the pineal gland of bullocks injected into the veins of dogs has no effect on the blood-pressure. The same extracts fed to babies cause increase in metabolic activity, as evinced by increased in nitrogen eliminated by the urine.

As to the twenty-one children, they found that as a group the twenty-one subjects have gained 2.23 points. Of the fourteen who gained, the average mental gain is 3.35 points. The fourteen controls gained as a group 1.35 points mentally. Of the nine who gained, the average mental gain is 2.11 points. The gain in the standing height for the twenty-one subjects averages 18.52 mm.; for the fourteen controls, 24 mm. In weight the twenty-one subjects gained an average of 2.06 kg., the fourteen controls, 2.89 kg. There was no loss of weight in either subjects or controls. In grip of R. H., the twenty-one subjects gained an average of .9 kg. as a group and the twelve who gained averaged 1.58 kg. each. The fourteen controls gained an average of 3.43 kg., the ten who gained averaged 4.8 kg. each.

Michigan State Medical Society Journal, Grand Rapids

May, XII, No. 5, pp. 247-306

69 *Complement Fixation Test in Diagnosis of Gonorrhea. R. G. Owen and H. Snure, Detroit.
70 Heart in Arteriosclerosis. C. H. Johnston, Grand Rapids.
71 Treatment of Trigeminal Neuralgia by Superficial Injection of Osmic Acid and Alcohol. T. C. H. Abelmann, Grand Rapids.
72 Clinical Factors in Roentgenography. A. W. Crane, Kalamazoo.
73 *Cirsoid Aneurysm of Hand. M. Ballin, Detroit.
74 Hypotension and Hypertension; Their Mechanism and Therapeutics. T. A. McGraw, Detroit.
75 Use of Sphygmomanometer in General Practice. W. J. Wilson, Detroit.

69. **Test for Gonorrhea.**—The authors found that the complement fixation test gives a very high percentage of positive results when gonococci are present, except in the very actue stage. Complement fixation will often point to the presence of gonococci when they cannot be demonstrated microscopically. A positive reaction was never found in a non-gonorrheal patient. Cured cases become negative in five to eight weeks. Persistence of a positive reaction beyond this time indicates that living organisms still exist. The test has shown that 10 to 20 per cent. of clinically cured patients are still infectious. Tests performed on a large number of individuals, selected at random without any regard to a gonorrheal history, show an astonishingly large percentage (7 to 20 per cent.) of positive results. The authors urge that all matrimonial candidates should subject themselves to the application of the Wassermann and gonorrheal tests if they have ever had syphilis or gonorrhea.

73. **Cirsoid Aneurysm.**—Ballin's patient tried to stop a sliding steel casing with his right hand, the mass of steel hyperextending the hand at the carpal joint with great force. He felt a sharp pain, and noticed, the next day, the veins on the dorsum of the injured hand were very much swollen. In the next few weeks, pain in the hand and, objectively, the swelling of the veins, were the most marked symptoms present. The swelling of the veins on the dorsum of the middle of the hand was so marked that the attending physician excised some of them, considering them to be merely varicose veins. But the swelling of the veins returned immediately and extended slowly to the little finger and on the palmar side into the hypothenar region; the hand was swollen, perspiring profusely and causing intolerable pain. When Ballin saw the patient seven months after the accident, the right hand was very much swollen, especially on the ulnar side. The swelling was not of an edematous character, but

seemed to be caused by overfilling with blood; the hand perspired very freely, especially on the little and the ring fingers; swelling extended somewhat on to the forearm. The back of the right middle hand showed marked varicose veins, which extended on volar side into hypothenar region and little finger. The veins showed slight pulsation. Flexion of hand and finger was painful; patient complained of throbbing pain in ulnar part of hand; it kept him from sleeping. On palpation, Ballin noticed a pulsation of the swollen hypothenar; by auscultation a loud bruit could be heard over the whole hypothenar region, extending along the ulnar artery two inches above the wrist. The bruit was loudest in the middle of the hypothenar region, being synchronous with the pulse. Elevation of the arm diminished the pain and the bruit. Compression of the brachial artery stopped all symptoms, which returned immediately on the cessation of the compression. Measurement of the left hand around the palm was 8 inches; the right measured 9 inches. The diagnosis of an aneurysm of the superficial end-branch of the ulnar artery with venous communication was obvious. Eight ligations of vessels were made, the patient getting a few weeks' relief from symptoms after each one. Amputation of the forearm finally became necessary and the patient made an uneventful recovery.

New Orleans Medical and Surgical Journal

May, LXV, No. 11, pp. 785-850

76 Rational Care of State's Insane. J. N. Thomas, Pineville, La.
77 Early Signs of Locomotor-Ataxia and Other Parasyphilitic Conditions of Nervous System. E. M. Hummel, New Orleans.
78 General Paralysis: Plea for More Thorough Prophylaxis. H. Daspit, New Orleans.
79 Intramuscular Injections of Mercury (Emulsion) in Treatment of Syphilis of Nervous System. L. L. Cazenavette, New Orleans.
80 Dementia Praecox, Some Suggestions for General Practitioner. F. W. Quin, Pineville, La.
81 Epilepsy: Cause and Treatment. H. L. Fougerousse, Pineville, La.
82 Experience with Poliomyelitis as Health Officer for Parish of Morehouse during 1911. O. M. Patterson, Bastrop, La.
83 Foreign Body in Esophagus Removed by Esophagoscopy: Foreign-Body in Bronchial Tract. H. Dupuy, New Orleans.
84 Present Status of Epidemic Cerebrospinal Meningitis in Louisiana. O. Dowling, Shreveport, La.
85 Laboratory Diagnosis of Cerebrospinal Meningitis. C. C. Bass, New Orleans.

New York Medical Journal

May 10, XCVII, No. 19, pp. 957-1008

86 Insane and Mentally Defective Aliens Arriving at Port of New York. G. W. Stoner, New York.
87 Preliminary Report on Diagnosis of Postpyloric (Duodenal) Ulcer by Means of Serial Radiography. L. G. Cole, New York.
88 High Tension, High Frequency Currents. J. H. Branth, New York.
89 What Practitioner Should Know of Wassermann Reaction. G. A. Wyeth, New York.
90 Psychogenic Psychosis. N. J. Dynan, Washington, D. C.
91 Eye Strain Symptoms in General Practice. I. Hartshorne, New York.
92 Indications for Operation on Inferior and Middle Turbinates and Serum. I. Grushlaw, New York.
93 Hospital Prophylaxis. L. D. Frescoln, Philadelphia.
94 Carcinoma of Hyperplastic Hypophysis. J. Funke, Atlanta, Ga.
95 *Tuberculosis of Liver with Jaundice. L. S. Milne, Kansas City, Mo.
96 Duodenal Tube: Its Value as Diagnostic and Therapeutic Agent. L. A. Doroff, Chelsea, Mass.
97 Biostatistics of Jewish Race Pertaining Especially to Immunity and Susceptibility. L. Levyn, Buffalo.

95. **Tuberculosis of Liver with Jaundice.**—The two cases cited by Milne presented much the same train of symptoms, although the first was much more acute. In each there was marked jaundice. The temperature and general condition was obviously tuberculous. The liver was particularly involved. In the first case the liver and spleen seemed to be the only two organs affected. In the second the disease was more widespread and much less acute, but in this case also the most extensive disease was jaundice of the liver and spleen. As the liver and spleen in both cases were apparently equally involved and the disease process so uniformly distributed in these organs, it appeared as if the infection originally was disseminated from some tuberculous focus in the mesenteric lymph-nodes. In the first case, however, the mesenteric nodes did not show any gross old standing disease. In the second these nodes were tuberculous, but in this case also the process was not particularly advanced. In view of the extraordinary frequency of tuberculosis of the mesenteric lymph-nodes without any extension to the liver, Milne says it is difficult to understand the factors which determine the widespread involvement of the liver and spleen in some cases. The same conditions, however, may be found in the relation of infection of the bronchial lymph-nodes to pulmonary tuberculosis. The intestines in both cases showed no evidences of any ulceration, either old or recent. In the second case, what seemed to be the oldest focus was situated in the adrenals.

Old Dominion Journal of Medicine and Surgery, Richmond, Va.

April, XVI, No. 4, pp. 153-211

98 *Single Transverse Incision for Use in Double Inguinal Herniotomies. E. S. Judd, Rochester, Minn.
99 Cases Illustrating Ocular Disturbances due to Disease of Nose and Accessory Sinuses. J. E. Weeks, New York.
100 Conservative Treatment of Hand Injuries by Means of Wet Antiseptic Dressings. W. P. Nicolson, Atlanta, Ga.
101 Antityphoid Inoculation As State and Municipal Duty. F. A. Coward, Columbia, S. C.

98. **Single Transverse Incision in Double Inguinal Herniotomies.**—Judd makes a transverse incision from 8 to 12 cm. in length, or longer in fleshy patients, from a point situated midway between the internal and external abdominal rings of one side to a similar point on the opposite side, thus connecting the two inguinal canals. The incision passes directly through the subcutaneous fat and exposes the aponeurosis of the external oblique muscle. The fat around the external ring is dissected away for a short distance and then by properly retracting the skin and subcutaneous tissues of either end of the incision, the entire inguinal canal of that side will be exposed. The hernia on this side is repaired and then the same retraction is made on the other side for the repair of the second hernia. After the operation on the hernias has been completed the superficial tissues are loosely sutured with catgut and the skin closed either by a subcutaneous catgut suture or a through-and-through horse-hair stitch. With this incision the exposure of either inguinal canal is said to be fully as satisfactory as that obtained when an oblique incision is made directly over the inguinal canal on each side. The entire length of the transverse incision is often not more than that of the oblique incision as it is ordinarily made for the repair of a single inguinal hernia. The bleeding is very slight, as a rule, only the small branches of the superficial epigastric vessels come into consideration. One of the principal advantages of this method is seen in those patients who have worn a truss which has compressed and hardened the region or possibly has blistered and broken the skin. The injured areas in such cases are low and beneath the inguinal canals, and are not encountered when the transverse incision is used.

South Carolina Medical Association Journal, Seneca

April, IX, No. 4, pp. 83-106

102 Acidosis, with Special Reference to Acetone Bodies. H. S. Mustard, Charleston.
103 Eclampsia. R. T. Ferguson, Gaffney.
104 Diabetes Mellitus. T. G. Croft, Aiken.
105 Syphilis. E. W. Carpenter, Greenville.

Texas State Journal of Medicine, Fort Worth

May, IX, No. 1, pp. 1-34

106 *Some Clinical Experiments in Treatment of Typhoid with Low-Calorie Food Values. M. L. Graves, Galveston.
107 Local vs. General Anesthesia. R. W. Knox, Houston.
108 *Malignant Papilloma of Lower Lip. E. Dunlap, Dallas.
109 Case of Complete Laryngectomy under Cocain Anesthesia. F. D. Boyd, Fort Worth.
110 Extra-Gastro-Intestinal Indigestion. I. S. Kahn, San Antonio.
111 Local Diseases Amenable to Surgical Treatment as Cause of Acquired Psychoneuroses. F. Paschal, San Antonio.
112 Sympathetic Ophthalmia. T. K. Proctor, San Angelo.
113 What Roentgen-Ray Should Mean to Physician. G. D. Bond, Fort Worth.
114 Case of Screw-Worm in Nose. C. L. Edgar, Cleburne.
115 Treatment of Prostatic Hypertrophy. J. R. Caulk, St. Louis.

106. **Low-Calorie Food Values in Typhoid.**—Graves' own experiments have extended over a few years and have covered more than a hundred cases. Last year fifty-one patients with positive diagnosis of typhoid were treated with low-calorie values. This is composed of milk and lime water, fed in six to eight-ounce quantities every three hours during the twenty-four. This is alternated from time to time, with an egg-albumin preparation composed as follows: The white of one egg, eight ounces of water, one dram of sugar and the juice of half a lemon or orange. In many cases the patients are carried through the entire attack of typhoid with only these two forms of foods, alternating every three hours and occasionally utilizing one alone for twenty-four or forty-eight hours. In caloric values they measure less than 1,000 units. Another feature incident to this treatment is the proper movement of the bowels. If the patient is fed an absorbable diet, say 98 per cent., there exists but little residue to pass through the bowels. If only 0.2 per cent. of a quart and a half to two quarts of milk and egg-albumin given per day is left as an unabsorbable residue, it will be seen that it will require six days to accumulate the normal amount of feces evacuated from the bowels every day in health. Frequently, Graves says, his patients will go six to ten days and two weeks and sometimes three weeks without a movement from the bowels. When being fed on a milk diet, lumps accumulate in the descending colon. Graves has them washed out by a simple laxative enema to avoid mechanical distention—not fermentation.

108. **Malignant Papilloma of Lower Lip.**—In Dunlap's case the growth involved all the lower jaw, leaving only one or two teeth; the lip and chin have been replaced by a large cancerous mass, which extends far out and then falls forward on the neck and extends to the sternum.

Wisconsin Medical Journal, Milwaukee

April, XI, No. 11, pp. 339-368

116 Differential Diagnosis of Morbid Conditions with Symptoms Resembling Neurosthenic Syndrome. A. W. Rogers, Oconomowoc.

117 Tracheobronchoscopy in Diagnosis and Treatment. W. E. Grove, Milwaukee.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Australasian Medical Gazette, Sydney

March 15, XXXIII, No. 11, pp. 229-252

1 Scylla or Charybdis. E. T. Smith.
2 Acute Abdomen. F. H. Kenny.
3 Extra-Uterine Pregnancy Twice in Same Patient. A. Andrews.

March 22, No. 12, pp. 253-274

4 Serum and Vaccine Therapy. D. A. Welsh.
5 Emotions and Their Relation to Mind. G. H. Taylor.
6 New Somnoform Inhaler. R. W. Hornabrook.

March 29, No. 13, pp. 275-296

7 Present Knowledge of Relation of Bovine to Human Tuberculosis. F. G. Griffiths.
8 Bacteriologic Examination of Sputum for Tubercle Bacilli. C. H. Shearman.

April 5, No. 14, pp. 297-324

9 Contract Medical Practice in New South Wales. C. Read.
10 Wassermann Reaction in Lead Poisoning. J. L. Gibson.
11 Fatal Case of Appendicitis Complicated by Spreading Cellulitis of Obscure Clinical and Bacteriologic Nature. R. S. E. Todd and C. H. Shearman.
12 Urticaria in Country Children Coming to Sydney. W. F. Litchfield.

British Medical Journal, London

April 26, I, No. 2730, pp. 865-920

13 *Etiology and Treatment of Puerperal Eclampsia. R. A. Gibbons.
14 Uses and Abuses of Proprietary Foods in Infant Feeding. H. C. Cameron.
15 Prevention vs. Cure in Modern Practice. C. J. Whitby.
16 Case of Chronic Plumbism in Which Multiple Aneurysms Occurred. R. G. Chase.
17 *Unusual Fertility in Syphilitic Parents, Associated with Anomalous Involvement of Children. H. F. Watson.
18 Gonococcal Urethritis in Boy Aged Seventeen Months. A. Smith and C. S. McKee.
19 *Tetany in Acute Suppurative Appendicitis in Adult. B. Hughes.
20 Adrenalin in Chloroform Anesthesia. H. T. Depree.

13. **Puerperal Eclampsia.**—Two methods of treatment of puerperal eclampsia in Gibbons' opinion deserve to be mentioned, because in the hands of some they seem to have been efficacious. One is the therapeutic employment of normal serum from pregnant women, as carried out by Mayer (Tübingen) and the other is the use of large doses of thyroid. Gibbon refers to Nicholson, who considers that thyroid extract is the ideal vaso-dilator in cases of eclampsia, but that it is necessary to use large doses; 30 to 40 grains are given at first, and a second dose of 20 or 30 grains in six or eight hours if there should be no improvement. He considers that the noteworthy points in relation to this treatment are the unusually early reestablishment of the renal functions and the rapid and complete disappearance of symptoms. He believes that normally thyroid secretion is the opposing influence which safeguards renal circulation from a dangerous overaction of the internal secretion of the suprarenals, which acts as a constrictor of the arteries and capillaries.

The best results, Gibbons states, will come to those who regard this, in the light of present knowledge, as a poison in the blood acting on the nerve centers; and as treatment of all poisons is by an antidote when the poison is known, and by elimination, and, failing this, dilution when the poison is unknown, so the simplest way of regarding a patient suffering from puerperal eclampsia is as one suddenly poisoned, and treat her accordingly. Therefore anything which will, in any degree whatever, strengthen the defensive forces of the body, will do good. Gibbons' belief is that venesection, combined with the endeavor to eliminate the poison, and dilution with saline transfusion will be of most service.

There are many cases, however, he adds, in which no treatment is of any avail, and which are mortally ill from the moment of the first convulsion. There are others, again, which are not so seriously affected, although this can never be known at first, and therefore they are the ones which may recover under any treatment whatever, and are the cases in which one is apt to have an exaggerated idea of the importance of any special line of treatment if it happens to be successful. If the temperature be steadily rising, the patient comatose, with a rapid pulse, tending to be more frequent and thready, a tepid bath may be given if this is possible. The patient may be put into a warm bath, which is gradually cooled down to 80 F. or lower, and allowed to remain in for twenty minutes. This doubtless acts in the same way as it does in serious cases of typhoid or acute rheumatism.

Recent statistics show that the best treatment is that of rapidly emptying the uterus—by whatever means this may be most safely accomplished—after the first few convulsions; that is to say, without indefinite delay. The woman and the child are thereby given the best chance of life, and, the maternal mortality has been lowered in the hands of some to under 5 per cent. The greater the delay in carrying out this treatment after the onset of the first convulsion, the greater will be the danger.

17. **Unusual Fertility in Syphilitic Parents.**—The points of interest in Watson's cases were that both parents denied specific disease and yet both showed evidence of syphilis on very minute physical examination. Parents and children all gave a positive Wassermann reaction. The manifestations of syphilis appeared to be more severe with successive pregnancies and yet there were no abortions. Six children were born in twenty-two months.

19. **Tetany in Acute Suppurative Appendicitis in Adult.**—Hughes' patient when first seen complained of acute abdominal pain. The onset was very sudden, and she had vomited once a bile-stained fluid. She was seen thirty-six hours after the onset of the pain. Four years previously she had been seized suddenly with acute abdominal pain, not so severe as the present attack, but she gradually got better without operation. Two years later she had another attack. Her symptoms suggested a gastric origin. She had suffered pain after food, constipation and lassitude, and she was never well for any length of time. She had never had hematemesis, jaundice or melena. The urine was dark, but contained no

extraneous matter. The temperature was 100 F., pulse 112 and regular, respirations 24. The abdomen moved only slightly on respiration, and this on the left side only. There was a rigidity and general tenderness all over the right upper and lower abdominal quadrants. Pain was noticed on deep pressure in the right loin. The right flank was dull, the liver dulness was normal. On rectal examination, thickening and tenderness was found high up on the right side. The condition of acute appendicitis was diagnosed. Two hours after admission the patient developed marked and typical tetany in both hands, and the pulse rose to 120. Her general condition suddenly became grave, and an immediate laparatomy was performed. She had never had tetany before.

The abdomen was opened, and an appendix abscess containing about 2 oz. of stinking pus was evacuated. The appendix was retrocecal and its tip was bound down to the lower pole of the right kidney. There was a perforation about 1 inch from the end, and a concretion had escaped. The appendix was removed with some difficulty and a large drainage tube inserted. The patient made an uneventful recovery. This case is the only one Hughes has been able to find in which tetany was associated with acute appendicitis.

Indiana Medical Gazette, Calcutta

April, XLVIII, No. 4, pp. 129-168

21 Trichostrongylus Colubriformis (Giles 1892), a Human Parasite. C. Lane.
22 Arsenic in Treatment of Kala-Azar. F. Roux.
23 Sanatorium Treatment for Phthisis in Civil Hospital. H. S. Matson and G. Singh.
24 Sanitary Requirements in Construction of Slaughter-House (Abattoir) in India. C. C. Murison.
25 Acute Yellow Atrophy of Liver. C. H. Smith.
26 Control of Eye in Cataract Operations. F. W. Sumner.
27 Extraction of Lens in Capsule. F. F. S. Smith.
28 Case of Bagdad Sores, Showing Apparently Long Incubation Period. R. S. Keelan.
29 *Case of Ovarian Fetation. F. C. Fraser.
30 Unusual Case of Enteric Fever (Typhoid). E. C. Taylor.
31 Case of Hat-Pin in Duodenum. K. L. Batavyal.
32 Rough and Ready Field Sterilizer. R. S. Kennedy.

29. **Ovarian Fetation.**—Briefly, the history of the case cited by Fraser is as follows: The woman was admitted with an abdominal tumor which she herself had noticed for about twelve months. She believed herself to be pregnant, but it was difficult to see on what grounds she based this as she stated that her periods had been quite regular up to date. She had noticed no quickening, nothing in fact save the steadily growing tumor. She was a multipara and a little milk could be squeezed from the breasts, a point of no significance in a multipara. When admitted she was screaming with pain, but her general condition was good, the abdomen being fairly lax and the pulse full and slow. On palpation a large, centrally placed tumor was made out, molded below into the pelvis and rising out of it as far as two inches above the umbilicus; the latter, however, was much displaced upward and was considerably nearer the ensiform than the pubes. The uterus could be felt perched on the front of the mass. The tumor was fairly smooth, cystic in parts, but hard in others, especially on the right; no fetal heart could be heard. The shape of the abdomen, except for the situation of the umbilicus, resembled a seven months' pregnancy.

Abdominal section was performed the following day, and on opening the abdomen a cystic tumor was disclosed, densely adherent to the omentum and intestines. After much ligaturing off, the tumor was freed except below. At this stage of the operation the cystic mass was accidentally punctured and a dark grumous fluid began to escape. On widening the puncture, the knife came down on bone and revealed a fetus, which on removal was found to be six and a half to seven months old. It had a dense clothing of lanugo which was easily removed as the fetus was partially macerated. The uterus was so much part and parcel of the sac that hysterectomy was performed. The right tube and ovary were normal, the left tube, enormously lengthened, ran across the sac, its lumen from uterine to fimbriated extremity was patent and normal so that it was clear the gestation had not originated in it. The cavity of the uterus was but little enlarged; the left ovary was absent and was evidently spread over the walls of the sac.

Journal of Tropical Medicine and Hygiene, London

April 15, XVI, No. 8, pp. 113-128

33 Trypanosome Causing Disease in Man and Animals in Sebungwe District of Southern Rhodesia. E. W. Bevan.
34 Filaria Loa Cases: Continuation Reports. G. C. Low.
35 Climatic and Other Factors Influencing Health of Europeans in Uganda and East Africa. A. R. Cook.

Lancet, London

April 26, I, No. 4678, pp. 1147-1218

36 Operative Treatment of Malignant Disease of Mouth and Pharynx. W. Trotter.
37 Bacteriologic Evidence in Support of Intestinal Intoxication. J. C. G. Ledingham.
38 *Vaccination for Various Infections with Living Micro-Organisms. W. Broughton-Alcock.
39 *Tests for Aceto-Acetic Acid, Including Simple New Test. W. H. Hurtley.

38. **Vaccination with Living Micro-Organisms.**—Broughton-Alcock describes the clinical observations and results from the vaccination of 150 patients as a curative method of treatment. In twenty-six cases of uncomplicated acute gonorrheal urethral discharge treated he has but once seen the discharge cease and failed to find any gonococci during three or four weeks. He does not attach any value to this result. He has tried in varied doses autogenous, non-autogenous and polyvalent living sensitized vaccines. To one patient he gave 100,000,000 non-sensitized living gonococci from a twenty-four hours' culture direct from a urethral discharge. There followed no good effect, no local or general reaction. Broughton-Alcock also tried the associated vaccination of living sensitized staphylococci albi (E) and streptococci cultures from a discharge, but these also failed to ameliorate the condition. No other treatment than that by vaccination was employed. He also adds that no patient who was treated suffered from any extension of the infection or complication.

The cases of discharge with complications are divided into two categories: (a) orchitis and epididymitis; (b) rheumatism, tendinitis, periarthritis, arthritis with exudation. In all twenty-five patients were treated. In section (a) the results were most satisfactory. Most patients were free from pain after the first injection; a few needed two. The two remaining patients were not free from pain until the third was given—all within a week. The large dose seemed to give the quicker relief. It took about three weeks to reduce the infiltration to the size of a pea, a nodule remaining in the globus minor. There were two cases of relapse, both apparently due to prolonging the interval, for rapid amelioration followed the next injection. Broughton-Alcock saw no relation between rapidity of relief and the previous duration of the infection. In section (b) there were four cases. After the first injection and within forty-eight hours acutely inflamed joints that one could barely touch, in one case of fifteen days' duration, were freely movable without pain. The exudation disappeared in three days. Vertebral pain and painful non-suppurating ganglions were also rapidly relieved by the first injection. The cure persisted when patients were seen one month later. The only instances in which there was not complete relief within a week were those of subacute tendinitis without exudation. They necessitated at least one to three weeks' injection treatment.

Broughton-Alcock's impression from experience is that great value lies in big doses, and that sensitized gonococci rapidly produce or stimulate a body reaction. He could start with a dose of 500 to 3,000 million sensitized gonococci without a very severe local or general reaction, and the doses could be augmented or similar injections given beneficially within seventy-two hours. Up to the present he has seen no advantage of the living sensitized gonococci over those allowed to die, and the preparation and injection require very delicate technic. Assured that the microorganism is adequately sensitized, Broughton-Alcock found a safe and beneficial procedure is to commence with 20,000,000 staphylococci or streptococci and 200,000,000 gonococci (dead), and to augment rapidly and as high as indicated, basing the injections on reaction, local

or general, for the two are not necessarily associated. The vaccines may be repeated every second day. A persistent local reaction does not indicate cessation, but only the need to go slowly, increasing the dose. Though not absolutely necessary to continue when, for example, a case appears cured after two or three injections, he has found it a much safer principle never to give less than six injections. Acute cases have done better with higher and daily doses. Broughton-Alcock prefers all vaccines in 1-2 c.c. of 0.8 per cent. saline. He has antistreptococcic, antistaphylococcic and antigonococcal serums prepared with many respective strains, and he keeps the sensitized virus vaccines of several strains in their "mother solution," applying them as indicated. All sub-cultures are kept going, the streptococci strains being based on Gordon's classification. Gonococcal vaccines are now always polyvalent.

39. **Tests for Acetonacetic Acid.**—Hurtley's test is performed as follows: To 10 c.c. of the urine add 2.5 c.c. of concentrated hydrochloric acid and 1 c.c. of a 1 per cent. solution of sodium nitrate; shake and allow to stand two minutes. Now add 15 c.c. of strong ammonia, followed by 5 c.c. of a 10 per cent. solution of ferrous sulphate or a solution of ferrous chlorid of equivalent strength (2 gm. of iron in 100 c.c.). Shake up, pour into a 50 c.c. Nessler glass and allow to stand undisturbed. It is not advisable to filter. A beautiful violet or purple color is produced. The reaction is a slow one, and the speed at which the color develops depends on the concentration of the aceto-acetic acid in the urine; the color deepens for several hours after its first appearance. The explanation which Hurtley offers of the test is that the aceto-acetic acid is converted by the nitrous acid into isonitroso-acetone, which forms a salt with the ammonia; the ferrous salt then produces a purple-colored salt from the ammonia salt by double decomposition. The test has been tried on several normal and on a large number of pathologic urines, and on the urine of patients taking salicylic preparations, but only urines which react with the other tests for aceto-acetic acid give this test. Acetone does not give the test, but an aqueous solution of ethyl aceto-acetate gives a pure blue color—not purple—and it only gives the blue color when much more nitrate is used than is prescribed in the test above. As regards delicacy, the test, when performed on a solution of sodium aceto-acetate, prepared in the way already described, shows at a dilution of 1 part of aceto-acetic acid in 50,000 parts of solution.

Medical Press and Circular, London

April 16, XCV, No. 3858, pp. 403-432

40 Early Diagnosis of General Paralysis. G. M. Robertson.
41 Three Cases of Tuberculous Disease of Lower End of Femur, Illustrating Pathology and Treatment. W. I. De C. Wheeler.
42 Investigation into Nature of Abdominal Rigidity. T. W. Wadsworth.
43 Various Forms of Fibrositis and Their Treatment. A. P. Luff.

April 23, No. 3859, pp. 433-458

44 Treatment of Cancer by Non-Operative Methods. A. Don.
45 *New Operation for Ulcers of Scalp in Roentgen-Ray Scar. A. Eddowes.
46 Evolution of Epidemics: Nineteenth Century—Specificity and Evolution. J. T. C. Nash.
47 What Is a Tuberculosis Dispensary? A. E. Harris.

45. **Operation for Ulcers of Scalp in Roentgen Ray Scar.**—No general anesthetic was administered or necessary to perform the operation described by Eddowes. The ulcers and their margins are dabbed gently with strong carbolic acid and this is wiped off in half a minute with methylated spirit. The bases of the ulcers are then destroyed by the actual cautery (Paquelin), as well as a considerable portion of the margin of each right down to the skull. Then the outer plate of the skull is well roasted with even and gentle pressure as considered just sufficient to destroy the outer dense bone only. The wounds, each about the size of a shilling, are enveloped in a large swab wetted with a strong solution of bicarbonate of soda. This dressing is wetted from time to time for two days, then allowed to fall off and be replaced by a large piece of lint well covered with boric acid ointment. The granulations are on no account to be interfered with when the ointment is changed daily. What discharge is not soaked up by a protecting pad of boric wool over the lint is to be wiped away, and that gently, up to near the edges of the burns.

Annales de l'Institut Pasteur, Paris

March, XXVII, No. 3, pp. 185-263

48 Anaphylaxis Not Due to Toxic Action of Any Special Substance. (Anaphylotoxine, peptotoxine et peptone dans leurs rapports avec l'anaphylaxie.) A. Besredka, H. Ströbel and F. Jupille.
49 *Relapsing Fever Transmitted by Louse. (Etiologie de la fièvre récurrente; son mode de transmission par les poux.) C. Nicolle, L. Blaizot and E. Conseil.
50 Antibodies for Ricin. (Etudes sur la ricine. 1. Préparation de sérums antitoxiques; leur activité.) C. Truche.
51 Experimental Study of Necrosis Bacillus. III. (Etudes sur le bacille de Schmorl.) E. Césari.
52 The Microbian Flora of the Large Intestine in Cattle and Sheep. J. Choukevitch.

49. **Transmission of Relapsing Fever by the Louse.**—The research reported shows that the bite of the louse seems unable to transmit the disease. Both monkeys and man showed no signs of the disease after they had been bitten by infected lice; in one instance 6,515 louse-bites proved harmless in this respect. The spirilla apparently disappear from the organism of the louse after a time but this is deceptive, as they reappear a week later in the same louse and persist in the louse body for about twelve days, when they disappear permanently. The infection of the louse may be transmitted to the young, and this hereditary factor is probably responsible for the conservation of the virus. The germs in the louse do not invade the mouth or digestive tract and thus have no communication with the exterior as long as the louse is alive and they die when the louse dies. When the louse is crushed on the skin and there are openings in the skin from scratching, the germs get into the system. It is in this way that man and monkey inoculate themselves with relapsing fever. The head-louse and the body-louse act alike in this respect. (See editorial in this issue.)

Bulletin de l'Académie de Médecine, Paris

April 15, LXXVII, No. 14, pp. 279-302

53 Paratyphoid Appendicitis. Walther and F. Widal.
54 Helminth of Anthropoid Apes Found Also in Man. (Bertiella satyri, de l'Orang-outang est aussi parasite de l'Homme.) R. Blanchard.

Journal de Chirurgie, Paris

April, X, No. 4, pp. 417-528

55 Technic for End-to-End Suture of the Ureter. (Uretéroraphie circulaire.) R. Proust and A. Buquet.
56 *Estimate Patient's Resisting Powers Before Attempting an Operation. (L'examen préopératoire de la résistance des opérés.) De Graeuwe.

56. **Estimate the Patient's Resisting Powers Before an Operation.**—Graeuwe had his attention called to the necessity for more careful estimation of what a patient will stand by the death of a supposedly healthy man of 60 after a simple uncomplicated operation for fistula of the anus. He died almost at once from fulminating uremia, the result of the unsuspected interstitial nephritis, evidently aggravated by the chloroform and by auto-intoxication from the constipation following the operation. The "operative shock" is in many cases undoubtedly the result of upsetting the balance in conditions which under ordinary circumstances are fully adequate for normal functioning. The patient's resisting power depends on the functional capacity of all his organs, but among them all the kidneys are the most important from this point of view. The changes in the kidney may be latent but with the injury from the anesthetic superposed they prove unequal to their task. Their insufficiency is often mistaken for operative shock or explained in other ways. Graeuwe insists that before attempting any operation on a patient over 50, the kidney functioning should be investigated with special care. We will thus learn what conditions we have to reckon with and can thus avert postoperative accidents. He found the best means for ascertaining conditions in the kidney to be by determination of the freezing-point of the blood supplemented by chromocystoscopy, that is, test injection of a

stain and examination of its appearance in the jet from each ureter mouth. When the indigo-carmin appeared in the urine in fifteen minutes or less, the freezing-point of the blood was always found normal. Whatever may be said in criticism of these methods from the standpoint of precision they have always proved in his experience a reliable index of conditions in regard to the resisting power of the patient in view of an operation. He describes his technic in detail; first he applies the chromocystoscopy test. If the findings are favorable with this and there is nothing in the patient's condition to suspect anything wrong, no further test is needed, but in case of doubt, the freezing-point of the blood is determined. He has thus tested thirty patients requiring prostatectomy and operated on all but one of them. Four died, one from pneumonia, one from peritonitis after the cancer operation and the two others presented a response to the tests which really forbade the operation, but it was applied as a last resort. In another case a man of 75 had pus in the urine and other signs of severe kidney trouble and the general condition was very bad, but the above tests gave such favorable findings that it was almost certain that one kidney must be sound and the operation done on this assumption proved an entire success. When the freezing-point of the blood is above —0.60 C. the outlook is favorable. At —0.60 he prefers cystostomy under cocain until the general condition has improved enough to permit an operation. When the freezing-point of the blood was —0.58 he operated with confidence even on patients of 78 and over, some with cancer, and the outcome always justified his expectations. His conclusions apply to operations on the urogenital apparatus; he is now studying acute infectious processes from this same standpoint.

Journal de Médecine de Bordeaux

April 13, XLIII, No. 15, pp. 227-240

57 Prophylaxis of Tuberculosis. (Les mesures de preservation dans la lutte contre la tuberculose.) C. Mongour.

Journal d'Urologie, Paris

April, III, No. 4, pp. 425-560

58 Roentgenoscopy of Incipient Hypertrophy of Left Heart. (L'hypertrophie localisée du cœur gauche révélée par l'orthoradioscopie au début de l'hypertension d'origine rénale.) F. Widal and G. R.- Lapointe.

59 Microscopic Miliary Tubercles at Ureter Mouth Early Sign of Incipient Tuberculous Process in Kidneys. (Méthode nouvelle de diagnostic de la tuberculose rénale.) L. Buerger (New York).

60 Operation for Calculi in Ureter. (Note sur le traitement chirurgical des calculs de l'uretère pelvien.) G. Lemoine. (Calculs de la portion intrapariétale de l'uretère.) S. Pascual.

61 Hydropyonephrosis with Calculi and Rudimentary Kidney in Man of 31. G. Marion.

62 Eight Calculi in Large Diverticulum of the Bladder. T. Nogier and G. Reynard.

63 Persistence of Chronic Gonorrhea Explained by Polyps in Urethra. Uteau and Saint-Martin.

64 Finger Enucleator for Perineal Prostatectomy. (A propos de la technique de la prostatectomie hypogastrique.) Bensa.

65 Retention Urinal After Cystostomy. (Appareil pour cystostomisés.) Badin and Uteau.

66 Danger of Infection of Others During Incubation Stage of Gonorrhea. (Précautions et soins pendant la période d'incubation de la blenorragie.) J. Janet.

67 Rupture of the Urethra. (Le traitement moderne des ruptures de l'urètre.) G. Marion.

Presse Médicale, Paris

April 12, XXI, No. 30, pp. 293-304

68 Roentgenoscopy of the Heart. (Examen radiologique du cœur.) H. Lebon and P. Aubourg.

Revue de Médecine, Paris

March, XXXIII, No. 3, pp. 161-256

69 No Tubercle Bacilli Found in Blood-Stream of Fifteen Tuberculous Patients Examined. A. de Verbizier.

70 *Paratyphoid Infection. (Les infections à paratyphus B. II.) E. Job.

71 *Tuberculous Disease of Colon and Vicinity, Twenty Cases. (Contribution à l'étude de la tuberculose inflammatoire du gros intestin.) M. Piéry and A. Mandoul.

70. **Paratyphoid Infection.**—Job had an opportunity to study twenty-eight cases of typhoid apparently originating from a recruit who entered the regiment with typhoid. There were two types of cases, those beginning insidiously, very much like typhoid, and those beginning suddenly with symptoms of acute gastro-enteritis, sometimes so severe as to be mistaken for cholera nostras. The course was shorter than that of typhoid and convalescence more rapid, but the only absolute means of differentiation was by bacteriologic examination. In almost all the cases the *Bacillus paratyphus B* could be demonstrated in the blood and was undoubtedly the causal agent. The germ is too wide-spread to make isolation and disinfection of all cases practicable, but active immunization by means of polyvalent vaccine may be successfully carried out. The same general hygienic precautions should be taken as in typhoid; carriers should be warned of their danger to their neighbors and particular cleanliness should be observed. On account of the frequent occurrence of paratyphus *B* in animals, all slaughtered animals should be examined bacteriologically for the germ, and if it is found, then the meat should be rejected even if no macroscopic change is found.

71. **Tuberculous Colitis and Pericolitis.**—Piéry and Mandoul conclude from a study of twenty cases that inflammatory tuberculosis is the real cause of many conditions diagnosed as simple mucomembranous enterocolitis or as plastic colitis or pericolitis. A number of cases of Hirschsprung's disease they believe may also be attributed to tuberculosis.

Revue Médicale de la Suisse Romande, Geneva

April 20, XXXIII, No. 4, pp. 285-356

72 Artificial Pneumothorax in Pulmonary Tuberculosis. (Sur la valeur pratique, les indications et les contre-indications du pneumothorax artificiel dans le traitement de la tuberculose pulmonaire.) R. Burnand.

73 From the Seat of War. (Dans les Balkans.—Serbie et Constantinople.) A. C. Matthey. To be continued.

74 Technic for Examination of Sputum. (Sur la recherche du bacille de la tuberculose. Seelos.

75 Diagnosis and Treatment When Both Kidneys are Tuberculous. (Tuberculose rénale bilatérale.) C. Perrier.

Semaine Médicale, Paris

April 16, XXXIII, No 16, pp. 181-192

76 Bacteriologic Diagnosis of Whooping-Cough. (Le diagnostic bactériologique de la coqueluche.) M. P. Weil.

April 23, No. 17, pp. 193-204

77 Phrenocardia: Sexual Psychogenic Cardiac Neurosis. L. Cheinisse.

Berliner klinische Wochenschrift

April 14, I., No. 15, pp. 669-716

79 *Treatment of Progressive Paralysis. A. Westphal.

79 Abbott's Method of Correction of Lateral Curvature of the Spine. (Ueber Abbott's Methode der Behandlung seitlicher Rückgratsverkrümmungen.) Joachimsthal.

80 The Chlorid Content of the Blood on Different Diets. (Der prozentuale Chlorgehalt des Blutserums bei kochsalzarmer und kochsalzreicher fleischfreier Ernährung sowie bei verschiedener Flüssigkeitszufuhr.) W. Arnoldi.

81 Hemolytic Jaundice. (Blutveränderungen bei Icterus haemolyticus.) Huber. (Zur Frage des hämolytischen Icterus.) M. Mosse.

82 Tumors in the Chest. (Zur endoskopischen Diagnostik und Therapie endothoracischer Tumoren.) A. Ephraim.

83 *Maneuver to Facilitate Delivery. (Ein neuer Kunstgriff zur unblutigen Erweiterung des grad-verengten Beckens.) G. Freudenthal.

84 Action of Phosphorus in Rachitis. (Ueber die Wirkung des Phosphors im Phosphorlebertran bei Rachitis als Inflammator.) W. Gessner.

85 Reliability and Comparative Simplicity of Claudius' Method and of Pfeiffer's Modification of Tsuchiya's Method for Quantitative Determination of the Albumin in the Urine by the General Practitioner. (Quantitative Eiweissbestimmungen im Urine für den praktischen Arzt.) E. Pfeiffer.

78. **Treatment of Progressive Paralysis.**—Westphal discusses whether paralytic dementia ever permits recovery. The long periods of subsidence of symptoms which are often observed should be studied with special care to determine the contributing factors and thus learn to utilize them in treatment. The progressive character of the disease renders its early detection peculiarly important. The "neurasthenic" stage which is the precursor of the paralysis is often erroneously interpreted, to the great detriment of the patient and his

family. The patient seems dull and stupid as he describes his symptoms, in marked contrast to the alert self-observation of the true neurasthenic. The expression seems vague and empty, and others may testify to changes in character and social demeanor. These should suggest oncoming paralysis even when physical examination reveals nothing suspicious. The Wassermann reaction and lymphocytosis in the cerebrospinal fluid throw still further light. He has always found the Wassermann reaction positive in the cerebrospinal fluid in all cases of unmistakable progressive paralysis. He remarks that treatment has not progressed in the last few years to keep pace with the progress in differential diagnosis. The main point is prophylaxis. The striking refractory behavior of the paralysis to mercury, salvarsan and iodin, in connection with the clinical picture and tissue findings are all hard to reconcile with the presence of spirochetes in the cortex unless we accept that the spirochetes have become so modified during the long interval since early infection that they resist all therapeutic measures. It is possible also that the spirochetes in the cortex lie at a distance from the blood-vessels and thus escape the action of the drugs introduced into the blood. The meninges may not be permeable for the drugs although permitting the passage of the spirochetes. This possibility suggests the necessity of supplementing the measures now in vogue by means to increase the permeability of the meninges, possibly by drugs to augment secretion and by venous congestion by means of a constricting band around the neck. In any event, the results of recent research show that the treatment of progressive paralysis should be made the subject of a new and vigorous onslaught since we have learned that it is no "metasyphilitic" or "parasyphilitic" infection but an active infectious process.

83 **Simple Means for Enlarging a Contracted Pelvis.**—Freudenthal describes a measure with which he found that the pelvis opened enough to permit the birth of a living child when preceding pregnancies had always required the sacrifice of the child. A cushion was placed under the patient's sacrum and the knees were drawn up to the middle of the abdomen during each labor pain. As the patient was unable to do this herself it was done by the attendants, one on each side, each forcibly pressing the patient's knee against the center of the abdomen, the legs turned outward. By this passive fixation of the femurs the gluteal and other muscles attached to the trochanters pulled the ilium outward on each side. This apparently stretched the ligaments of the sacro-iliac articulation, the promontory sank backward and the whole pelvis became enlarged.

Deutsche medizinische Wochenschrift, Berlin

April 3, XXXIX, No. 14, pp. 633-680

86 The Comparative Anatomy, Topography and Function of the Cerebellum. (Zur Funktion des Kleinhirns.) L. Edinger and R. Barany.
87 Influence of Certain Infections on Rabbit Testicle. (Verhalten des Kaninchenhodens bei experimenteller Trypanosomen- und Spirochäteninfektion.) P. Uhlenhuth and E. Emmerich.
88 Experimental Production of Antibodies in Cattle. (Experimentelle Erzeugung von Tuberkulose-Antikörpern beim Rind; zugleich ein Beitrag zur Tuberkulose-Immunisierung.) E. Rothe and K. Bierbaum.
89 Reflex Influences from Gastro-Intestinal Tract on the Blood-Pressure. (Einfluss intraabdominaler Drucksteigerung und des Füllungszustandes des Magens auf den Blutdruck.) A. Fundner.
90 Changes in Spinal Cord with Progressive Atrophy of Spinal Muscles. (Rückenmarksveränderungen bei spinaler progressiver Muskelatrophie.) O. Huber.
91 Carbohydrate Diet in Diabetes. (Kohlehydratkuren bei Diabetes.) H. L. Richartz.
92 Blocking the Brachial Plexus. (Zur Anästhesierung des Plexus brachialis nach Kulenkampff.) P. Babitzki.
93 Treatment of Excessive Menstrual Hemorrhage. A. Rieck.
94 The Benefit from Local Hyperemia in Acute Affections. (Ueber feuchte Verbände und feuchte Umschläge bei akuten Erkankungen.) P. Herz.

April 10, No. 15, pp. 681-728

95 General Principles for Treatment of Infectious Diseases. J. Grober.
96 *Sugar Content of Blood. (Ueber den Zuckergehalt des Blutes.) H. Tachau.
97 *Gold in Treatment of Tuberculosis. (Zur Chemotherapie der Tuberkulose mit Gold.) W. Heubner.
98 *Camphor in Pneumonia. (Ueber die Wirkung von Kampferwasser.) H. Leo.
99 Appendicitis and Paratyphoid Infection. (Appendicitis und Paratyphus B.) C. B. Merrem.
100 Properties of Guinea-Pig Serum Interfering with Wassermann Reaction. (Ueber eigenlösende Eigenschaften des Meerschweinchenserums.) E. v. Gierke.
101 Serodiagnosis of Syphilis. (Erfahrungen mit der Hermann-Perutzschen Syphilisreaktion an 600 Fällen.) F. Lade.
102 Abbott's Method of Correction of Curvature of the Spine. (Die neue Verbandbehandlung der Skoliose nach Abbott.) O. Vulpius.
103 *Treatment of Spastic Paralysis in Children. (Die spastische Lähmung im Kindesalter und ihre Behandlung.) K. Biesalski.
104 Genu Valgum. (Zur Aetiologie und Therapie des Genu valgum.) H. Heinlein.
105 Fusing of Bones of Forearm. (Die kongenitale Vorderarmsynostose.) H. Maass.

96. **Sugar Content of Blood.**—This subject was reviewed editorially April 19, 1913, p. 1228. Tachau here states that the sugar content of the blood is very important in estimation of the true condition in diabetes mellitus. There is a pronounced increase in every case, even before sugar appears in the urine. It thus serves as an early index of the intensity of the disturbance in the metabolism and also as a guide to the progress of the case under treatment. The aim should be to bring the sugar proportion down to normal, and treatment should be kept up until this is realized. Ingestion of 100 gm. of grape sugar does not increase the proportion of sugar in the blood in healthy persons, but it sends it up when there is any pathologic disturbance in the metabolism of sugar. This is of great practical importance, Tachau reiterates, as hitherto we have had only the examination of the urine to rely on. In thirty healthy persons tested, 0.1 per cent. was the upper limit after the ingestion of 100 gm. of sugar, with 50 gm. white bread, fasting; in nineteen cases the average was 0.086 per cent. In diabetics the proportion runs up to 0.2 and over, even when there is no glycosuria. The communication issues from His' service, and the matter is discussed from various standpoints. The tests can be applied to 10 or even 5 c.c. of blood; the variations between the findings on polarization, with Bang's copper and Knapp's mercury reduction technics are slight and of no clinical moment.

97. **Chemotherapy of Tuberculosis with Gold.**—Heubner calls attention to his experimental research which suggests that the taking up of the gold preparations by the bacteria—as reported by Feldt recently—is due to the impregnation of the protecting envelope alone.

98. **Camphor in Pneumonia.**—Leo recently reported excellent results in curing experimental pneumococcus infection by intravenous injection of a saturated aqueous solution of camphor. It acts in this way much more effectively than by subcutaneous injection in oil. Thirty-eight rabbits inoculated with pneumococci and then given an injection of 20 c.c. every hour of the cold solution lived much longer than the controls. He here supplements his article (in No. 13) with the statement that Ehrlich and Böhncke found subcutaneous injections of camphor in oil effectual in protecting mice against pneumococcus infection.

103. **Treatment of Spastic Paralysis.**—Biesalski reiterates anew that the treatment of spastic paralysis stands and falls with the success of measures to exercise the limb. All other measures, of whatever nature, merely serve to pave the way for exercise therapy. Mechanical aid may prove very useful; they lay tracks for physiologic movements and create memory pictures for normal movements. It is a great help to do the exercises in a warm bath or after application of superheated air; the first reduces the weight of the limbs and both soften up the tissues by the hyperemia induced and thus render it easier to move the limbs. For the hand, one of the best measures is some manual craft work, ambition and the example of others keeping up the interest and spurring to greater efforts. He says that the first and most important principle is that the spastic muscle should never be left in repose; it must be exercised and trained incessantly. At least six hours a day should be devoted to this systematic exercise treatment. For the legs, study of the physiologic gait is a help in the therapeutic exercises, first passive in bed, then active, then standing leaning against the wall, then with crutches, then with

two canes and then one, and finally with only a string for the patient to hold by. Children must be trained to hold themselves very erect, as if on military parade. Years are necessary to bring a severe case of Little's disease to the point where one cane is all that is needed. In conclusion he urges study of the question of the extent of spontaneous recovery and when it sets in, and further study of the physiologic laws on which the exercise therapy should be based.

Jahrbuch für Kinderheilkunde, Berlin

April, LXXVII, No. 4, pp. 383-504

106 *Permeability of Walls of Infant Intestine. (Die Durchlässigkeit des Magendarmkanales für heterologes Eiweiss bei ernährungsgestörten Säuglingen.) F. Lust. Commenced in No. 3. H. Hahn.

107 Whey in Infant-Feeding. (Anwendung der Molketherapie bei ruhrartigen Darmkatarrhen und ihre Erfolge.) E. A. Frank. See Abst. 117, p. 1404.

106. **Permeability of Intestinal Wall for Alien Albumin.**—Even in the new-born, moderate amounts of foreign albumin may be ingested without its penetrating the normal intestinal wall. With advancing age the tolerance increases. Lust experimented on 100 children with egg albumin and found that a quantity equal to that contained in two eggs could be given without its passing through the intestinal wall and being demonstrated in the blood or urine in healthy children. But in diseased conditions of the intestinal tract he could find albumin in the blood and urine when much smaller quantities were given. The permeability of the intestinal wall was greatest in acute intoxications. Precipitating sera were used to demonstrate the albumin in the blood. It appeared in the urine more readily than in the blood. Lust remarks that the albumin of cattle and horse sera is less suitable for the test than egg albumin. This test may be of value clinically in determining the condition of the intestines, for recovery may take place even when albumin passes into the blood in considerable amounts.

Medizinische Klinik, Berlin

April 13, IX, No. 15, pp. 567-610

108 Overfatigue. (Uebermüdung.) A. Schmidt.

109 *Diabetic Coma. (Das Wesen und die Behandlung des Coma diabeticum.) F. Rolly.

110 Tumors in the Lungs. (Ueber Komplikationen und besondere klinische Verlaufsweisen der Lungengeschwülste.) A. Fraenkel.

111 Tuberculin Salve Reaction. (Studien über Tuberkulin-Percutanreaktionen.) F. Wegerer.

112 Calcium in Therapeutics. (Ueber Calciumtherapie.) P. Saxl.

113 *Tubercle Bacilli in the Blood-Stream. (Vorkommen von Tuberkelbacillen im strömenden Blute.) H. Dreesen.

114 Analysis of the Dissociated and Athetoid Motor Disturbances in Traumatic Hysteria. A. Wimmer.

115 Hemorrhage from the Uterus of New-Born Infants. A. Juda.

116 Internal Hemorrhage the Seventh Day After Contusion of the Spleen. H. Hahn.

117 Urobilinogen in Urine as Index of Liver Disease. (Kurze Bemerkung zur differentiellen Diagnostik der Affektionen der Leber.) E. Münzer.

118 Differential Blood-Count. (Die Differenzierung der weissen Blutzellen in der Zählkammer.) R. Lenzmann.

109. **Diabetic Coma.**—Rolly has been examining the blood in hundreds of patients in the last few years to determine its electric tension. The list includes a number with diabetic coma. While in health the blood shows moderate alkalinity, in eleven cases of diabetic coma there was an acid reaction in three; in the others the blood proved to be alkaline. One patient succumbed to the coma who had an entirely normal reaction in the blood. These findings indicate that the coma and the fatal termination could not have been due to the action of acids alone. The patients who showed an acid reaction were given sodium bicarbonate up to such amounts that the blood reaction became normal, and yet the general condition did not improve and the fatal outcome was not averted. Diabetic coma is thus proved to be not a pure acid intoxication in the sense of Naunyn. Experience has shown that coma once developed is beyond our influence. Treatment must therefore aim to prevent its development or to arrest it in its incipiency. Sodium bicarbonate should be given freely as it promotes the elimination of the acetone bodies. If the coma is already installed, Rolly advises intravenous injection of a liter of a 3 to 5 per cent. solution of the bicarbonate, some by the mouth and injecting 50 gm. of the solution several times a day by the rectum. In addition he advises infusion of from 3 to 5 liters a day of saline with possibly venesection just preceding. A mild purgative may aid in the elimination of the poison; it may help to rinse out the stomach and intestines although Rolly has never witnessed any benefit from this himself. Still more important are stimulants and drugs to promote diuresis.

113. **Tubercle Bacilli in the Blood-Stream.**—Dreesen examined the blood of seventy patients and found tubercle bacilli in 74 per cent. of thirty-one patients with unmistakable tuberculosis; in 55 per cent. of nine suspects, and in 46 per cent. of thirty free from any signs of tuberculosis. He thus obtained positive findings in 60 per cent. of the total seventy cases but inoculation of 128 animals was followed by development of tuberculosis in only one instance.

Münchener medizinische Wochenschrift

April 15, LX, No. 15, pp. 793-848

119 *Physiologic Surgery. R. Klapp.

120 Experimental Salvarsan Treatment. (Verhalten des Nervensystems gesunder Kaninchen zu hohen Salvarsandosen.) B. Doinikow.

121 *Technic for Testing Kidney Functioning. (Notiz zur Funktionsprüfung der Niere.) K. Schlayer.

122 Eosinophilia Under Arsenic Treatment. (Ueber allgemeine und lokale Eosinophilie bei Ueberempfindlichkeit gegen organische Arsenpräparate.) H. Schlecht.

123 Exploratory Injection of Salvarsan. (Die praktische Verwendbarkeit der provozierenden Wirkung des Salvarsans.) Kall.

124 Cerebral Symptoms under Salvarsan ("Vasocommotio cerebri," ein neuer Symptomenkomplex von Gehirnerscheinungen schwerster Art nach Salvarsaninfusionen, eine mittelbare Folge des Wasserfehlers.) M. Müller.

125 Quadruplets and Their Mothers. (Vierlinge und Vierlingsmütter.) H. Hauser.

126 Rupture of Gravid Uterus in Cesarean Section Scar. G. Schwarz.

127 Localization of Foreign Body in the Eye. M. Reichmann (Chicago).

119. **Physiologic Surgery.**—Klapp remarks that a book on the behavior of the organs under pathologic conditions is needed, written from the standpoint of the surgeon—a companion to Krehl's "Pathologic Physiology." Both surgical physiology and physiologic surgery require further development, and he cites numerous instances where empiric methods have proved their usefulness and further study of the physiology involved has explained the reasons for the benefit from them. The old treatment of diffuse peritonitis on the same principle as treatment of an abscess, proved a mistake, and progress has come as physiologic conditions became more and more respected, leaving the major part of the work to the peritoneum itself and refraining from anything that will lower the vital powers of the peritoneum. He advocates sifting all methods and selecting always the ones which resemble most closely physiologic conditions. He hopes that the recent research on keeping tissues alive outside of the organism will result in the discovery of some fluid which can be regarded as absolutely physiologic. To date we know of nothing of the kind; physiologic salt solution is far from the ideal. Blood-serum seems to be proving the best nutrient medium in Carrel's work in this line, thus showing that it is the most physiologic. But its use for infusion and rinsing out the peritoneal cavity is questionable on account of the individual differences in blood-serum. He has given up trying to rinse out the abdominal cavity with diffuse peritonitis on account of the lack of a fluid which would be free from all chemical action on the peritoneum, and he merely aspirates out all of the exudate with a large vacuum tube before he rinses or dabs the cavity dry. Rehn ascribes great importance to restoration of the abdominal pressure, and his method of immediate closing of the abdominal cavity has proved great progress but not for the reasons he advances, but rather for the reason that the physiologic conditions are restored, chilling prevented, and peristalsis favored. As Klapp looks over the field of surgery in the last few years he notices that wherever progress has been realized it has been in the line of closer imitation of phy-

siologic conditions. In plastic operations on the dura, for example, the various technics applied failed until foreign substances were avoided and autoplastic substances, fascia or fat implants, were used. In conclusion he says that the empiric route has brought us forward but in a slow zigzag course, while the physiologic route takes us straight, sure and quickly to the goal. It is still difficult to determine in the individual case what is physiologic and what not, and what is physiologically most important from that which is physiologically trivial. Here we are aided by Miss Empiricism and her twin, Casuistics.

121. **Tests of Kidney Functioning.**—Schlayer discusses the technic for the intravenous injection of lactose as a test for kidney functioning. The qualitative findings are not enough, as his experience in over 300 cases has shown. The Nylander test may prove misleading unless compared with the quantitative findings with the polarimeter. When the exact technic is not followed the results are liable to be misleading. Those reported recently from intraspinal or subcutaneous injections are not available for comparison. The lactose and potassium iodid tests do not indicate the functional capacity of the kidney in the ordinary sense; they indicate rather the kind of injury and thus the nature of the functional disturbance. Four other tests are applied to obtain this information: ascertaining the elimination of sodium chlorid when an excess is taken; elimination of water after an excess; the reaction of the kidney to a given test meal, and the reaction to the action of diuretics. In dubious cases it may be necessary to apply all these five methods to throw enough light on the case.

Petersburger medizinische Zeitschrift, St. Petersburg

April 1/4, XXXVIII, No. 7, pp. 79-92

128 Suppurative Internal Ear Disease. (Symptomatologie und Pathogenese der eitrigen Labyrinthitis und die Indikationen zur Labyrinthoperation.) R. Wolferz.
129 Regurgitation in Young Man, Developing After Febrile Illness and Persisting for Years. (Fall von Ruminatio humana.) N. Franz.
130 Hydrogen Dioxid and Hydrolysis. (Wasserstoffsuperoxyd als hydrolysierendes Prinzip.) S. Schumowa.

Wiener klinische Wochenschrift, Vienna

April 10, XXVI, No. 15, pp. 561-604

131 *Treatment of Syphilis. (Quecksilber und Salvarsan.) E. Finger.
132 Experimental Leukemia. (Zur Lehre über die Leukämie.) J. v. Wiczkowski.
133 The Autonomic Nervous System in Course of Pulmonary Tuberculosis. (Verhalten des vegetativen Nervensystems bei tuberkulösen Erkanrankungen der Lunge.) F. Deutsch and O. Hoffmann.
134 Benzol in Leukemia. (Beeinflussung des Stoffwechsels durch Benzol und seine Darreichung bei der Leukämie.) I. Sohn.
135 *Aneurysm of Abdominal Aorta. K. Byloff.
136 No Appreciable Influence from Mercury on Growth of Mouse Cancers. S. Skudro.
137 The Plague in the Sixth Century. (Das klinische Bild der Pest bei Procopius.) H. Schröder.

April 17, No. 16, pp. 605-648

138 Serodiagnosis of Goiter. (Ueber organabbauende Fermente im Serum bei endemischem Kropf.) J. Bauer.
139 Technic for Serodiagnosis. (Ueber Verwendung von aktivem und inaktivem Serum bei dem Komplementablenkungsversuch.) M. Hesse.
140 From the Seat of War. (Kriegschirurgische Erfahrungen.) P. Clairmont.
141 Technic for the Meiostagmin Reaction. (Die Meiostagminreaktion bei Verwendung von Lezithinextrakten.) E. Ferrari and L. Urizio.
142 Neurology in the Seventeenth Century. (Joh. Peter Frank und die Neuropathologie.) M. Neuburger.

131. **Present Status of Treatment of Syphilis.**—Finger gives data and an array of arguments to sustain his view that salvarsan in combination with mercury can be relied on to abort the primary phase in the Wassermann-negative cases; in the tertiary stage it is also indicated when rapid action is necessary. But in the Wassermann-positive early cases, as also in the early secondary stage, salvarsan had better be omitted from the treatment. Even under these restrictions we have no guarantee against the development of a hemorrhagic encephalitis. He also warns that we have no experience to date to show the final outcome in patients with general paralysis, tabes and aortitis given salvarsan treatment. He cites 142 salvarsan fatalities which have been reported in the three years since its introduction (Marschalko), while only seventy fatalities are on record from mercury in the course of sixty years of use. He quotes Hallopeau's surmise that there has been a conspiracy of silence in regard to the by-effects of salvarsan. Those suggesting acute arsenic poisoning are relatively slight and briefly transient as a rule, but he refers to a number in which acute nephritis, hemorrhagic encephalitis or enteritis proved fatal in a few days. Of the encephalitis cases he cites nine which terminated in recovery, twenty with necropsy and five with a fatal outcome without post-mortem examination. Recent experimental research has confirmed the assumption that the encephalitis is the work of the toxic action of salvarsan. He gives data which show that the "water error" or other explanations suggested are untenable. Ruhmann reported recently severe cerebral phenomena with persisting paralysis after salvarsan in a woman who had never presented symptoms of syphilis but the Wassermann was faintly positive.

The neurorecurrences, or nervous relapses, he ascribes to the syphilitic process itself in a certain proportion of cases, while in others there is no doubt that the trouble is an arsenical polyneuritis. The tardy neurorecurrences have an incubation period of two or three months and they occur almost invariably in patients who have been given salvarsan at the close of the primary stage and early in the secondary, and thus at the time when the organism is most profusely flooded with spirochetes. It is plausible to assume that the spirochetes are leading a saprophytic existence on the meninges, doing no harm until the toxic action of the salvarsan is felt by the tissues under them, especially the capillaries. This reduces their resistance and the spirochetes can then exert their nefarious action. Inadequate treatment thus favors the neurorecurrences but at the same time the most energetic combined treatment does not guarantee against them.

135. **Aneurysm of the Abdominal Aorta.**—Byloff was not sure whether the symptoms presented were due to aneurysm of the abdominal aorta or to disease of the pancreas. The fact, however, that the symptoms showing disturbance in pancreas function varied within such a wide range with intervals of normal functioning, showed that the trouble could not be cancer of the pancreas or chronic hardening, and the absence of colic testified against the presence of a concrement.

Zeitschrift für Urologie, Berlin

February, VII, No. 2, pp. 81-180

143 Inflammation of Neck of the Bladder. (Zur Pathologie und Therapie der Cystitis colli proliferans s. vegetativa.) S. M. Gorodistsch.
144 Tuberculous Process in Half of Double Kidney. B. Dobrotworsky.
145 Urethral Calculus in Bilharziasis. (Ein Harnröhrenstein bei Bilharziakrankheit.) E. Pfister.
146 Technic for Suprapubic Prostatectomy. J. Goldberger.

March, No. 3, pp. 181-260

147 Old Gonorrheal Urethritis Flares Up During Influenza; Cure by Vaccine Therapy. (Beitrag zum Studium der Harnröhrenerkrankungen.) E. Roucayrol.
148 Syphilis of the Bladder. R. Picker.
149 Pneumaturia and Apparent Subsidence of Glycosuria in Diabetics with Bladder Disease. Teschemacher.

April, No. 4, pp. 262-340

150 Six Nephrectomies. (Demonstrationen zur Nierenchirurgie.) W. Israel.
151 Cancer of Syncytial Structure in Bladder of Young Man. (Fall von malignem Tumor der Blase von syncytialem Bau.) A. Blecher and Martius.
152 *Atrophy of the Prostate. (Zur Chirurgie der Prostatatrophie.) H. L. Posner.
153 *Bladder Tumors in Workers with Aniline Dyes. (Blasengeschwülste bei Arbeitern in Anilinfabriken.) A. Lewin.
154 *The Prognosis in Nephritis. (Zur Prognosenstellung bei Nephritiden.) H. Strauss.

152. **Atrophy of the Prostate.**—Posner comments on the peculiar fact that two apparently opposite processes in the prostate, hypertrophy and atrophy, may cause the same or very similar symptoms. In the four cases of atrophy at the Heidelberg surgical clinic in the last three years the cause of the trouble was different in each: in the first, chronic gonorrhea; in the second, senile involution, and in the third a valve formation from atony of the bladder, remedied by an oper-

ation on the bladder. In the fourth case the atrophy seemed to be from a defect in development. Prostatectomy may be considered when the patients are suffering from retention, but an operation in case of atrophy is not so simple and easy as is the enucleation of an enlarged prostate. A suprapubic operation permits correction of a valve formation in case there is anything of this kind.

153. **Bladder Tumors in Workers with Anilin Dyes.**—Lewin reports a new case of an especially malignant bladder tumor in a man of 49 who had worked for twenty-five years in an anilin factory but had left this occupation over six years before the bladder tumor developed. The first symptoms were hematuria and dysuria; by the fourth month there was general cachexia and the tumor was found inoperable. During the last six years the man had had nothing to do with the anilin products. This long interval confirms what others have observed in like circumstances. The man told of eight similar cases he knew of among the other workmen in the course of his service. Four recovered without medical treatment and four died, including two who had been operated on. Lewin compares his case with those reported by Leuenberger, summarized in THE JOURNAL, Nov. 30, 1912, p. 2009.

154. **The Prognosis in Nephritis.**—Strauss has been studying for years various means for determining the outlook in chronic nephritis. Among others, comparison of the nitrogen content of the blood-serum and of the urine showed that in health there was about 30 or 40 mgm. of residual nitrogen *(Reststickstoff)* in 100 c.c. of serum, while in case of insufficiency of the kidneys the amount ran up sometimes to 200 mgm. The outcome in such cases showed that an abnormally large proportion of nitrogenous waste in the blood is always a grave symptom. He has worked out a technic with which it is possible to determine with precision the proportion of residual nitrogenous waste in even as small an amount as 12 or 15 c.c. of blood. The albumin in the blood is filtered out by the following technic: About 20 c.c. of acetone-free methyl alcohol is poured in a jar graduated to 50 c.c. Then 5 c.c. of blood-serum is poured in, a drop at a time. The jar is then filled to the 50 c.c. mark with methyl alcohol and set aside for two hours; the contents are filtered through a dry filter and then 3 or 4 drops of a 10 per cent. alcoholic solution of zinc chlorid are added to the filtrate and the whole set aside until a flocculent precipitate has been thrown down. It is then filtered again through a dry filter and about 30 c.c. of the filtrate is evaporated on the water bath to expel the alcohol. The residue is taken up in a little water and the nitrogen content determined by the Kjeldahl method. Strauss gives a number of tables showing the findings and the outcome of the nephritis. Death always ensued within a few weeks or months or even sooner when more than 150 mgm. of residual nitrogen was found in 150 c.c. of blood-serum. Any proportion over 75 mgm. renders the outlook dubious. A lesser content by no means excludes impending uremia or other dangerous complications. The test is equally instructive in both acute and chronic nephritis but its most important application is in distinguishing between coma of uremic origin and coma from cerebral hemorrhage. Only positive findings are of decisive moment.

Zentralblatt für Chirurgie, Leipsic

April 19, XL, No. 16, pp. 593-632

155 *Gangrene from Paralysis of the Vessels Following Exposure to Moderate Cold. (Gefässparalytische Kältegangrän.) Wieting.

156 *Paralysis of Phrenic Nerve After Blocking of Brachial Plexus. (Phrenicuslähmung bei Plexusanästhesie.) R. Klauser and A. E. Stein.

155. **Gangrene of the Feet from Exposure to Cold.**—Wieting relates that large numbers of soldiers in the Turkish army developed symmetrical gangrene of the toes or feet from long exposure of the feet to cold although the cold was never below the freezing-point. Some had had to stand in rain or cold mud or in cold windy places and most of those affected were either undernourished or had dysentery at the time or just before. The cases became more numerous when the force was stationed long at one point and the circulation was not kept up by marches or other exercise. The affection is nothing new but its occurrence in such large numbers and the almost uniform course, first the protracted exposure, then the bowel trouble and then from the sixth to the tenth day after the exposure the symptoms of gangrene. The symptoms ranged from itching and pains to chilblains and actual gangrene, all showing the paralysis of the vessels and injury of the innervation with stasis and thrombosis. The outcome in final recovery was astonishingly frequent so that conservative treatment was often brilliantly rewarded. Amputation was done only in one case, compelled by the unbearable pain and increasing debility.

156. **Paralysis of Phrenic Nerve from Blocking of the Brachial Plexus.**—Stein reports the case of a young woman who developed severe neuralgia and paralysis of the phrenic nerve after an attempt to block the brachial plexus. It had been unsuccessful and not a drop of fluid had been injected as the patient did not experience the paresthesia which is the rule when the brachial plexus is duly reached and the needle is in the right place for injection of the anesthetic. The injury from introducing the needle alone must have been responsible for the disturbances. The symptoms seemed to be those of a developing pleurisy at first but there was no fever, and the symptoms gradually subsided, the whole trouble lasting about two and a half weeks. This case warns that it might be dangerous to block the brachial plexus on both sides at one sitting as serious results might follow if the phrenic nerve on both sides should become paralyzed at the same time.

Klauser has encountered three cases of the kind but he does not regard the trouble as paralysis of the phrenic nerve but rather as a spasm of that side of the thorax from irritation of the thoracicus longus by the needle. In none of the three was there any pain in the diaphragm-attachment region; it developed rather in the region between the second and seventh ribs and the anterior axillary line to the median margin of the scapula. This corresponds to the area of the serratus anticus, and spasmodic contracture of this muscle would readily explain the pains and disturbances in breathing; they were like those after a rib has been fractured, but it was peculiar that none of the symptoms developed until after an interval of about forty-five minutes.

Zentralblatt für Gynäkologie, Leipsic

April 19, XXXVII, No. 16, pp. 561-600

157 Bacteriologic Examination in Gynecologic Disease. E. Scholl and W. Kolde.

158 Untoward By-Effects with Modern Oxytocics. (Kritische Betrachtung zur Frage unserer modernen Wehenmittel.) C. Koch.

159 Transposition of Large Blood-Vessels. E. Leibich.

Zentralblatt für innere Medizin, Leipsic

April 19, XXXIV, No. 16, pp. 393-416

160 Epidemic Cerebrospinal Meningitis Apparently Cured by Diphtheria Antitoxin; One Case. N. A. Rawitsch.

Policlinico, Rome

April 13, XX, No. 15, pp. 509-548

161 Cystopexy. (Contributo clinico all'applicazione della cistopessia per il ripristino delle funzioni vescicali.) C. Ferro.

April, Medical Section No. 4, pp. 145-192

162 Epidemic of Infectious Jaundice; 25 Cases. (Considerazioni cliniche e ricerche batteriologiche in una epidemia d'ittero infettivo a Tripoli.) F. Scordo and G. Rizzuti.

163 Experimental Immunization Against Typhoid. (Nuove osservazioni sull'immunizzazione attiva contro le sostanze pirogene contenute nella anafilatossina tifica.) A. Tadini.

164 Experimental Research on Aggressins. (Contributo allo studio del meccanismo d'azione degli essudati aggressinici e dei sieri antiaggressinici.) M. Fernando.

Semana Medica, Buenos Aires

March 13, XX, No. 11, pp. 621-684

165 Action of Alkalines and Mineral Waters. (Las fechorias de los alcalinos y las aguas minerales.) V. Delfino.

166 Lumbar Puncture and Epinephrin in Epilepsy. (Mal comicial.) M. Morales.

167 Mountain Sickness. Transient Upset of Kidney Functioning. (Nueva teoria de la patogenia del mal de las montañas.) L. M. Cowley.

168 Vision Tests for Chauffeurs. (La vision de los conductores de automoviles.) M. Menacho.

169 *Sputum Stain. (Sobre un nuevo metodo de coloracion del bacilo en los esputos de la tuberculosis.) F. Mas.

March 20, No. 12, pp. 685-740

170 Serotherapy of Cerebrospinal Meningitis. A. G. Alfaro and R. Iribarne.
171 Typhoid Bacillus Carriers. (La fiebre tifoidea y los portadores de bacilos.) V. Delfino.
172 Hygiene of Hearing for Schoolchildren. (El oido del niño. M. J. Rizzi.
173 Notes on Chemistry. (Apuntes de quimica.) V. Delfino
174 Anaphylaxis to Quinin. (Nota documentada de fisiopatologia general. La anafilaxia quininica y su tratamiento.) M. Morales.
175 Injurious Effect of Hair Dyes on the Eyes. (Las perturbaciones de la vista por teñirse el cabello.) J. S. Fernandez.
176 Moving Pictures and Their Influence on Children. (Influencia adversa o favorable del cinematografo en la salud fisica y mental de los niños. A. G. Gaspar.

169. **Stain for Sputum.**—Mas advocates a modification of Much's staining technic which shows up the tubercle bacilli more distinctly, he claims, and in a fraction of the time. After fixing by passing three times through the flame of an alcohol lamp or by keeping at 120 C. for thirty minutes, the material is covered with three or four drops of Lugol's iodo-iodid solution and heated till it begins to steam, then cooled and heated anew twice more, then well rinsed in water and blotted between filter paper. The specimen is then treated with gentian violet as by the Ziehl-Nielsen method, that is, heating three times till it steams slightly each time. (This stain is made with 1 gm. gentian violet; 5 gm. phenol crystals; 10 gm. alcohol and 100 gm. water.) The next step is to decolorize with 25 per cent. sulphuric acid. Follow with alcohol at 95 C. rinse in distilled water, dry with filter paper and immerse for eight to fifteen minutes in a mixture of equal parts of alcohol and acetone. Then stain with a 1 per cent. aqueous solution of methylene blue for 30 or 40 seconds. Rinse thoroughly in distilled water; dry and mount in balsam.

Nordiskt medicinskt Arkiv, Stockholm

XLV, Surgical Section No. 3. Last indexed Nov. 16, 1912, p. 1836

177 *Hypertrophy of the Mamma. (Beitrag zur Kenntnis der Hypertrophia mammae.) A. J. Juhle.
178 *Operations for Inguinal and Femoral Hernia. (Ergebnisse von 295 in der Zeit 1900-1909 operativ behandelten Leisten- und Schenkelhernien.) R. Ingebrigtsen.
179 *Sporotrichosis. S. Widerøe.
180 Gall-Stone Operations; 223 Cases. (Beiträge zur operativen Behandlung der Gallenwegekrankheiten.) N. Paus. To be continued.

177. **Hypertrophy of the Mamma.**—Juhle reports two cases of enormous enlargement of the breasts in women of 23 and 27. The mammae were of normal size until the age of 21 and 18 respectively. In the second case the breasts weighed separately 4.2 and 2.9 kilograms after their removal. The enlargement seems to be merely an exaggeration of the physiologic development of the breast. It may occur in the newly born, at the time of puberty or during a pregnancy or without any connection with birth, puberty or pregnancy, but 63.9 per cent. of the seventy-two cases Juhle has found on record occurred in connection with puberty; 22.2 per cent. were connected with a pregnancy; four cases were in newly born infants, and in 8.3 per cent. there was no connection with either of the above periods.

178. **Herniotomies.**—Ingebrigtsen gives the details of seventy-three cases of incarcerated inguinal or femoral hernias and 222 simple hernias given operative treatment and 167 of the patients reexamined after a few years. There has been recurrence in only three cases, that is, in 1.47 per cent., which is a more favorable figure than he finds recorded from other European clinics. Among the three cases of recurrence in two, the buried Bassini sutures had sloughed out. Suppuration occurred in eight cases, but it did not bring back the hernia except in the above mentioned two instances. The proportion of recurrences after the Bassini operation was only 1.72 per cent. One elderly patient died from diffuse bilateral bronchitis and weakness of the heart the third day after the Bassini operation on the large right inguinal hernia and Kocher on the smaller left hernia. Ingebrigtsen regards this—his only fatality—as due to the ether in a man of 61 subject to recurring bronchitis. The tendency to bronchitis was not known at the time of the operation.

179. **Sporotrichosis.**—Widerøe reports a case in a working man. The extensive lesions were on the arm and subsided apparently permanently under potassium iodid. [He commences his report with the statement: "Since de Beurmann in 1903 described the first case of sporotrichosis . . ." He evidently is not acquainted with the earlier American literature on the subject.]

Norsk Magazin for Lægevidenskaben, Christiania

April, LXXIV, No. 4, pp. 441-592

181 Pathologic Anatomy of Cystic Disease of the Kideny. O. Berner.
182 Diuretics: Indications and Mode of Administration. O. Scheel.
183 *Tonsillitis as Factor in Acute Rheumatism. (Aetiologiske og patogenetiske forhold ved rheumatismus acutus med særlig henblik paa tonsillitens betydning.) A. Vetlesen.

183. **Tonsillitis as Factor in Acute Rheumatism.**—Vetlesen quotes from Eyerlen (1789) *Materia rheumatica ad tonsillas deposita* to show that the connection between tonsillitis and rheumatism has long been known, but it seems to have been forgotten for a century. He reviews the experiences in this line at the Christiania public hospital, describing some cases of general sepsis from chronic tonsillitis and fourteen cases of acute rheumatism in which 78 per cent. of the patients had a manifest acute or chronic tonsillar affection. In the three other patients there was a possibility of another source for the infection. He compares his cases in detail with recent literature on the subject and draws the conclusion that the streptococci causing rheumatism have undergone some special change in the interior of the tonsil. The predisposition is thus of a local nature, occurring only in the tonsils. Cholera germs and tetanus bacilli have a pathogenic influence only when they get into certain tissues. Subcutaneous injection of cholera germs does not induce cholera; it follows only when they get into the intestines, while, on the other hand, tetanus bacilli do not induce tetanus when they get into the intestines but only when they have penetrated through the skin. This conception of the predisposition as a circumscribed local capacity for changing the character or the quality of the microbes is sustained by many facts in pathology and in the life of plants. The streptococcus of erysipelas is a typical *Streptococcus longus* but many cases are on record in which the streptococci have seemed to acquire other properties. Sørensen has recently reported the case of a young man who had tonsillitis, then erysipelas, the eleventh day otitis media; three and twelve days later, recurrence of the erysipelas, the next week tonsillitis with an abscess requiring incision after seventeen days. Five days later recurrence of the erysipelas, then tonsillitis after two weeks, then two recurrences of erysipelas within a month and a week later a discharge from the ear, and the next month the glands in the neck suppurated. He finally recovered his health by the end of the fifth month after the first symptoms. The case is cited as showing the transformation of the erysipelas streptococci into pyogenic streptococci, and Vetlesen ascribes this to the local influences at work in the diseased tonsils. The tonsils should be either removed in these cases or tonsillotomy should be done followed by daily painting with iodin, thus sterilizing deep into the follicles. He has found this effectual. His experience has shown further that in the cases with chronic tonsillitis in which polyarthritis developed, the latter was of a protracted form with exacerbations. In the group with acute tonsillitis followed by acute rheumatism, both tonsillitis and rheumatism were of an acute benign type followed by complete recovery. In conclusion he quotes Eppinger's report of three cases of acute nephritis following on tonsillitis. The latter had caused no symptoms but an incision revealed pus in the depths and the nephritis subsided promptly after the operation on the tonsils.

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184 Radio-Active Substances in Internal Medicine. H. Jansen. Concluded in No. 16.

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185 Fatal Meningitis in Infant from Influenza Bacillus. H. Giese